# THE MINING CONGRESS JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

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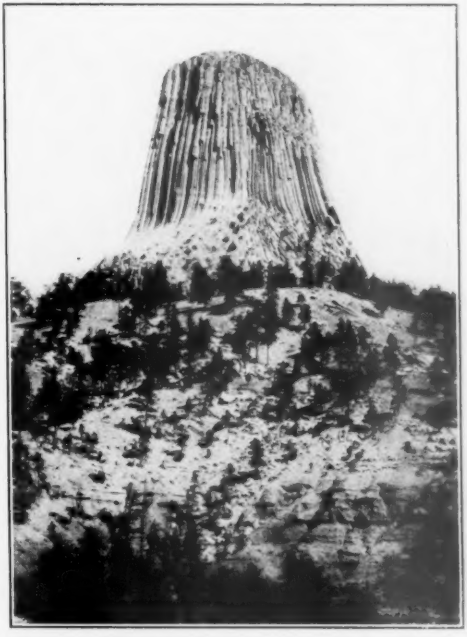
No. 2

FEBRUARY, 1916.



*Photograph by N. H. Darton.*

DEVIL'S TOWER, WYOMING
A geological phenomenon

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# THE MINING CONGRESS JOURNAL

FEBRUARY CONTENTS 1916

# The American Mining Congress

The American Mining Congress is a voluntary association supported by the dues and fees of its members. It is striving to bring about:

*First*—Safety and efficiency in mining operations.

*Second*—Intelligent conservation with a view to the highest development and use of our mineral resources.

*Third*—The stimulation of investment in practical mining operations by showing that mining is a legitimate business when intelligently conducted.

*Fourth*—Uniformity in state laws governing mining operations carried on under like conditions.

*Fifth*—Such federal co-operation through research and investigation as will furnish the basis for intelligent state legislation, and will solve those problems of economical production, treatment and transportation which are essential to an increase in mineral production.

*Sixth*—The improvement of the economic conditions underlying the coal mining industry.

If you are interested in this work, now is the time to help; do not wait until those who are now carrying the burden have become discouraged.

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**THE AMERICAN MINING CONGRESS**

**Munsey Building, Washington, D. C.**

**THE AMERICAN MINING CONGRESS .**

**APPLICATION FOR MEMBERSHIP**

.....191.....

I hereby make application for membership in THE AMERICAN MINING CONGRESS and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same.

*Name*.....

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*To the Members of the American Mining Congress:*

Do you know that you are the owners and publishers of the MINING CONGRESS JOURNAL? We trust you will realize the responsibility of this ownership and that you will lend your active assistance in making the Journal a greater success.

Real mining men should be active members. An application blank will be found on another page of this issue.

Associate memberships are designed for those not actively interested in mining, but who are willing to assist a state Chapter of the Mining Congress in helping to develop the Mining industry within the State. All memberships include subscription to the MINING CONGRESS JOURNAL.

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**SUBSCRIPTION AND APPLICATION FOR ASSOCIATE MEMBERSHIP**
IN THE
## AMERICAN MINING CONGRESS

.....191.....

I hereby make application for Associate Membership in THE AMERICAN MINING CONGRESS, and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same. Herewith find $1.00 fee and $2.00 dues for one year, including subscription to the Mining Congress Journal ($1.00 of which is designated as subscription to Journal).

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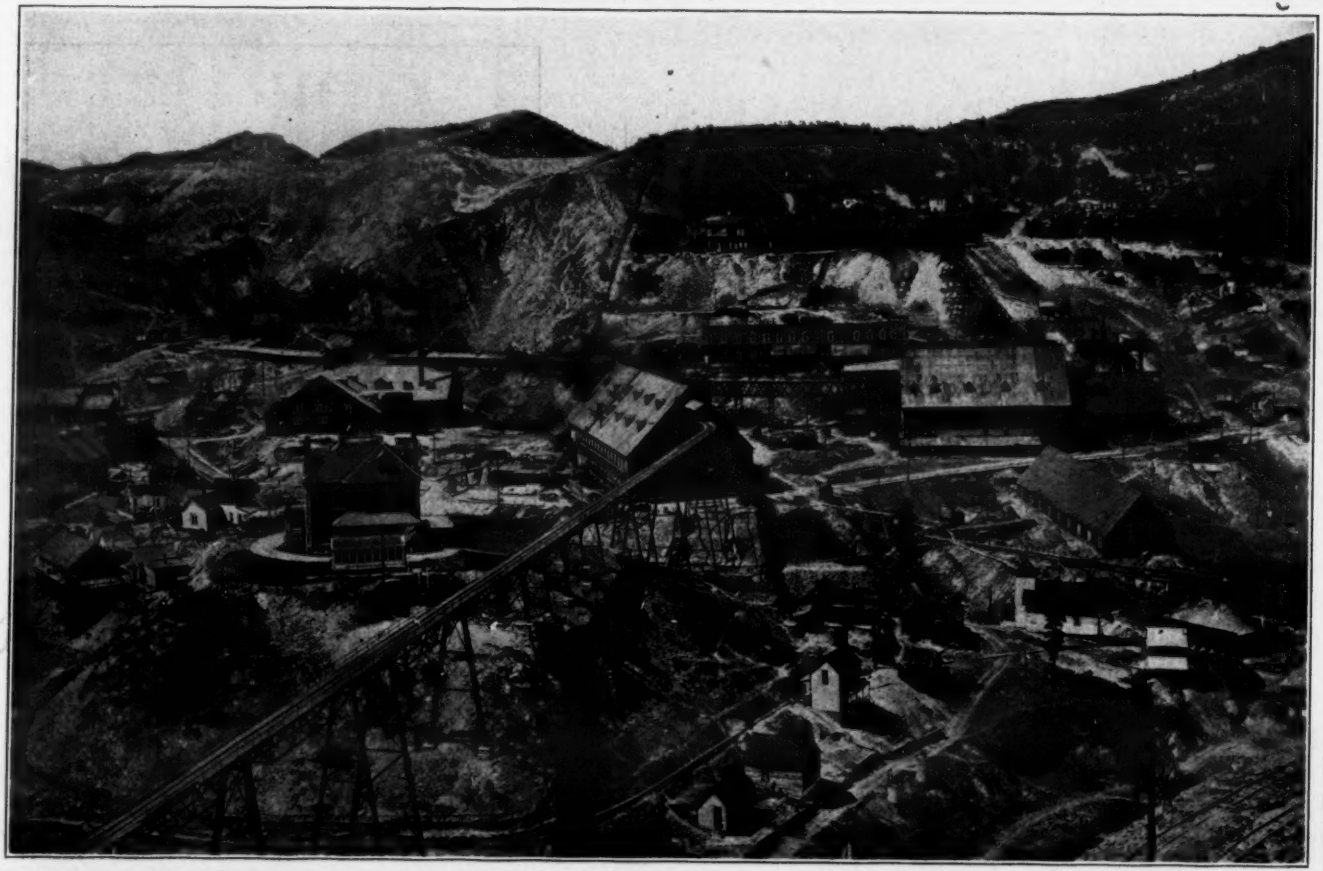

THE GREAT HOMESTAKE MINE, LEAD, S. DAK.

VOL. 2, NO. 2 WASHINGTON FEBRUARY, 1916

THE MINING CONGRESS JOURNAL

*Official Organ of the American Mining Congress*

# MINES AND MINING COMMITTEE PIGEONHOLES SMOOT AND TAYLOR BILLS

## Long Fight for Investigation before Attempting to Revise Mining Laws Defeated by Action of House Committee—Subcommittee Will Draft Bill Providing Changes in Law—May Be Presented at This Session

By a vote of seven to six the House Committee on Mines and Mining, January 24, blocked the attempt to secure a commission for the purpose of investigating what revision of the mining laws the West desires. The committee decided to name a subcommittee which will frame a bill without the services of a commission. It is expected this bill will be ready for presentation at this session of Congress.

The action of the committee means that the Smoot bill, which had passed the Senate, will die in the pigeonhole of the House committee and that the Taylor bill, intended to accomplish the same end, will have no chance to get before the House.

Representative Taylor, of the Committee on Mines and Mining, commented as follows on the action of the committee:

"I am very much disappointed at the action of the Mines and Mining Committee in voting seven to six to decline to pass my bill or Senator Smoot's bill for the appointment of a commission. I do not feel that the action of the committee in authorizing the appointment of a subcommittee of five to draft a codification of the mining laws will be either effective or satisfactory. Such action is not what the mining interests of the West want or what they had a right to expect.

"Of course this unfortunate situation comes entirely from the fact that of all the membership of the Mines and Mining Committee of the House I am the only one who lives west of the Mississippi River. The other members know little or nothing about metal-mining conditions in the West and neither they nor their constituents have any personal or direct interest in the matter. They are not to blame. The committee has jurisdiction over coal mining and all members of the committee have coal-mining interests in their districts. As a result their direct interest and concern on that committee pertain to coal mining.

"I have no idea that the subcommittee will visit the West or take any systematic action to make an investigation of conditions that need remedial legislation. I doubt if it will be of any important service. However, if the committee will take up the work and give the investigation the necessary time, which I do not believe it can do, it may be able to make some piecemeal recommendations for amendment to the mining laws that may be of some service. While I hope that this may be the case I do not expect anything of the kind.

"I cannot resist a feeling of serious disappointment and regret that a great committee should take this action in direct defiance and utter disregard of an earnest and unanimous appeal of every Representative and Senator in Congress from the sixteen Western States, supported as they were by the positive endorsement and recommendation of the Secretary of the Interior and of the Bureau of Mines.

"I cannot see any justification for the utter disregard of the wishes of the people of the western half of the United States when they are united on a subject and when the expense involved is so trivial as the amount asked to make possible intelligent legislation."

Chairman Foster, of the committee, who was among those who opposed the appointment of a commission, said:

"I believe that there should be changes in the mining law. There were only three changes advocated in all the hearings that we just have completed. I do not believe the situation is one that cannot be handled intelligently by the subcommittee aided by the men in Congress from the Western States. Judge J. W. Thompson, chief of the legal section of the Bureau of

Mines, is a very able man and particularly qualified to give assistance in this work. We are assured of his cooperation. In this way we hope to be able to meet all demands for revision and to get the legislation on the statute books at this session of Congress."

Senator Smoot and Representative Taylor lay no small portion of the blame for the action taken with regard to their bills on the shoulders of James Wickersham, the delegate from Alaska. Judge Wickersham declares that he simply presented his side of the case to the committee as did Senator Smoot and Representative Taylor. His conclusion is that the committee must have considered that his presentation of the case was more meritorious.

Due to the fact that most of the members of the committee have only a general idea of the needs of the mining industry with regard to a revision of laws, it was necessary to spend a great deal of time in discussing the history and rudiments of the question. This was done very ably by a number of those who spoke.

### SENATOR WALSH APPEARS

Senator Walsh was on the stand during the first day's hearing. Some of his declarations were in substance as follows:

Great as is the need for revision of the laws governing metal mining it is nothing like as necessary as is the case with the non-metalliferous deposits. A commission of three can do the work as well as five. A well-contested mining law suit well may cost $500,000. The abolishing of the apex law has been necessary in every country which has made use of such a regulation. The American Mining Congress, the American Institute of Mining Engineers and the Mining and Metallurgical Society of America, the three national organizations, have gone on record in favor of a complete revision of the mining laws. The development of dry farming is resulting in more strifes than ever between the miner and the homesteader. The public mind, in the mining states, has not yet centered on just what ought to be done in regard to revising the laws.

The old-time prospector is opposed to any change. The commission should see them as well as all others interested, directly or indirectly, in the industry. New laws are needed badly by the coal mines of the West. The urgency of action with regard to non-metallic deposits is such that they should not have to wait the action of a commission. There is great need for the development of the phosphate deposits in the West. The capital to invest in this industry is ready; all it needs is the attention of Congress.

In reply to a question by Chairman Foster, Senator Walsh declared it to be his opinion that it would be impossible to get a commission from Congress which could give the time to the work that would be necessary. He also cautioned against allowing the Bureau of Mines and the Geological Survey in taking a guiding position with regard to the revision of mining laws. He called attention to the fact that the present position of the Government with regard to mineral lands would make it very desirable for no Government expert to be on the committee.

### MR. CALLBREATH SPEAKS

James F. Callbreath, Secretary of the American Mining Congress, went extensively into the needs of revision of the mining laws. He concluded his forty-minute talk before the committee by saying:

"A few years ago it was thought, after all of the incentives which make possible the investment of private capital in the construction of transportation facilities in the new countries had been taken away by the withdrawal order, and railroad construction, or the greater part of it, which had been undertaken had been stopped at that time, the people of the country felt that something should be done to open up Alaska. Someone evolved the idea of government construction of a railroad, and a commission was appointed. Now this nation is pretty well confirmed in its opinion as to the advisability of the government construction of railroads, but notwithstanding that fact a commission went out to Alaska, came back and made a report and within four or five years from the inception of that idea, and acting to a large extent upon suggestions of that commission, a bill appropriating $35,000,000 was enacted by the Congress, and the railroad is now in the process of construction. In the one instance we were 30 years trying to frame a law to meet conditions which the whole nation agreed should be met in a liberal, broad way, and in another instance, through a commission, in four or five years we have appropriated $35,000,000 to do a thing upon which public opinion is very evenly divided. So I say in this instance the railway commission going to Alaska was effective in reaching results, while in the matter of opening up Alaskan coal without a commission, coming out to advise Congress as to what the conditions were, we have absolutely failed in getting results.

"The question is only one of practicability. We want results and our organization, after a number of years of investigation of this subject through a very able committee, devised this plan of reaching it.

"Mr. Walsh told you of the apex law, and the bad things growing out of that apex law. There are many men who do not believe the apex law should be abolished. They say that the apex law having been in effect all these years, and the courts having built up a system which the people now understand, it is better to leave it alone now no matter how advisable it would have been originally to create different regulations. So if you undertake to frame a law simply abolishing the apex law, you will find a lot of opposition to it. Upon the other hand, if a commission shall go out and investigate all those conditions and come back and say that it is the consensus of the opinion of men engaged in the practical workings of this industry, I believe you have then got something on which you can base intelligent action. I am not particular whether the commission shall be paid or whether it shal not be paid. I am not particu-

lar who shall compose the commission, except this, I do feel that a man who knows the practical ends of mining should be upon that commission. We need the professional man; but we also need the man who understands the practical conditions which are to be considered. What I desire is simply an effective commission, with or without pay, but with that dignity which will enable it to come back to you and command your respect."

### SENATOR THOMAS SPEAKS

Senator Thomas is of the opinion that the laws should be thoroughly revised or let alone. In his talk to the committee he placed greatest emphasis on the law of the apex, but also called attention that other features of the mining law are in as serious need of revision. He characterizes the law of the apex as causing more needless litigation than any other statute ever enacted. Fifty per cent of this litigation, Senator Thomas declares, is unnecessary. The law, he said, is less understood now than it was forty-four years ago. He described it as being bewildering and confounding and that decisions made by different courts, with regard to cases which arise under the law, are absolutely unreconcilable. Every new decision, he says, simply tends to befog the law more. He called attention to the fact that the United States is the only country in the world in which this law exists. The fact that it is not applied in Michigan is the reason for Michigan's having one case of litigation to each 100 in the West. He referred to the Canadian and Mexican codes as being very much superior to the American mining laws. He pointed out that some of those who would see the law continued as at present are those who thrive on the litigation which it causes.

### ENORMOUS WASTE

Twenty-five per cent of the entire output of the mines of the West have been absorbed in litigation, Senator Thomas said. He is of the opinion that it is not absolutely necessary to have a commission as there are many men in each House of Congress who are familiar with mining and its needs. He also suggested that such eminent scientific men as Horace Winchell and John W. Finch and many others of equal ability would be very glad indeed to lend any assistance within their power toward accomplishing an intelligent revision of the present mining code Referring, however, to statements that Congress is tiring of commissions, Senator Thomas held that generally speaking, commissions are very useful and one probably would be very helpful in furnishing data on which to base intelligent revision of the mining laws.

The principal objections to a congressional committee of investigation is not that men of sufficient ability could not be secured in Congress, but that Representatives and Senators have not time to spend a year working on one question. Mr. Taylor suggested that if they did some one else would be occupying their seat in Congress when they returned.

During the hearing frequent mention was made of the meeting held in Washington, December 16, by the national mining organizations. Mr. Ingalls, in addressing the committee, called attention to the fact that this meeting was not of any one organization, but was a meeting in which the three national mining organizations cooperated. Mr. Ingalls' talk to the committee was devoted largely to a presentment of reasons as to why the laws should not be revised piecemeal. He declared that there is no one in the mining industry at the present time who could revise intelligently the mining code. Despite all of the efforts that have been made to ascertain just what would be best for the entire industry, the facilities for proper investigations never have been enjoyed and as a result there is still much difference of opinion as to what a revised code should provide, he said.

### REVIEWS WORK DONE

Mr. Ingalls reviewed the history of the attempt to revise the mining law. He told of the efforts of many years by the American Mining Congress and of the American Mining Congress Committee of which he was a member. It was very plain for the committee to judge, from his remarks, as to the unselfish efforts that have been made by mining men themselves, in an effort to ascertain the revision that is necessary. They have expended considerable sums of money and large periods of their valuable time in endeavoring to coordinate opinion in this regard. Dr. Ingalls expressed the opinion that after all of this work, that there is still great difference of opinion, that the only means by which an absolute knowledge of what is necessary is a commission with the prestige that would come to envoys of the Federal Government, who could get first-hand information from all classes affected.

An extract from Mr. Ingalls' remarks is as follows: "A number of years ago a resolution was introduced at a meeting of the American Mining Congress, of which Mr. Callbreath is secretary, appointing a committee to consider rules and regulations for metal mining with the view to increasing safety in operation. We were perfectly aware that that was a problem that concerned the States, not the National Government, but the idea that we had was that if we should prepare a form of carefully digested legislation the several States would use that as a model for legislation. The committee that was appointed to consider this matter consisted of myself as chairman, Mr. Channing, Mr. Finlay, John Hays Hammond, and Dr. Douglas. As we proceeded with the work we found wide differences of opinion regarding these matters. One district had certain conditions, another district had other conditions. Some people thought that certain things ought to be, while others thought they ought not to be. We encountered many subjects about which nobody knew the right thing—in many cases nobody had thought about them at all—for the practice of mining had been steadily developing and in many directions had outstripped classified and coordinated knowledge. Our way of handling these conflicting opinions was to detail assistants to collect and study all possible evidence, to

consult experts in special matters, and to publish our proceedings from time to time, circulating them among people all over the country, asking them what they thought about things. Finally, when the different ideas came before the committee they were discussed in debate and were settled by vote of the committee, and with few exceptions had been so developed by the previous studies that the vote of the committee was unamimous.

"Well, we were able to prepare a final product in that way that I think met with universal approval. Not long ago I happened to meet one of our chief critics in certain points—a man who thought during our early stages that we were writing wrong things into our proposed law—and I asked him what he thought of the final product. He replied that it had his unqualified approval; that the committee had met all of his objections and had disarmed his criticisms. That is the kind of feeling that we want to have toward a revision of the Federal law governing mining titles.

"Now it seems to me that in order to have the right kind of legislation in a matter of this kind the start has got to be made in something like the way that I have described. Bearing further on this idea let me offer another bit of evidence. This committee on rules and regulations for mining, that I have mentioned, from time to time published interim reports. One of those interim reports containing a proposed draft for a bill was practically written into the laws of the State of Arizona. A few days ago my attention was called to a paper on recent legislation affecting the mining industry by Mr. Walter Douglas, of Bisbee, Ariz., Mr. Walter Douglas being general manager of Phelps, Dodge & Co., the largest mining company in that State, and one of the largest mining companies in the Union.

"Mr. Douglas made these remarks:

It has been singularly fortunate for the State of Arizona that some time prior to the convening of its first legislature the American Mining Congress had appointed a committee of distinguished members to compile a code applicable to the conditions obtaining in metal mines and that the rough draft of its report was available for the legislature when confronted with the necessity of framing a law as directed by the constitution.

With a few minor and one major exception, the code drafted by that committee was adopted and became the present law under which mines are operated in this State. It is a pleasure to be able to say that State inspection—

"That was something that this code specially provided for—

instead of being a detriment or an embarrassment in operating, has become a positive benefit, in that it has kept the management in close touch with underground conditions through the State inspector and has assisted those in direct charge by association with an outside point of view. Perhaps part of the success has been largely due to the ability, tact, and helpfulness of the mine inspector, who has converted prejudice and suspicion into hearty cooperation.

In conclusion, therefore, it is a fair assumption, which is borne out by actual experience, that ill-digested legislation, such as that above cited, has not been of financial or moral benefit to the wage earner, but has served to embarrass an industry on the material prosperity of which this State to a large extent depends.

"Mr. Douglas is here referring to workmen's compensation legislation.

Emphasizing this, the contrast between the carefully considered 'mine inspection law' and the hastily framed and illogical compulsory compensation and eight-hour laws is striking.

"That is exactly what we want you to do. We want you to defer to the unanimous demand of the mining industry that the mining law be revised in a carefully considered way; that you will give us carefully considered legislation, not hastily framed and illogical and poor legislation."

### CHANNING SHOWS MAPS

J. Parke Channing displayed to the committee maps and blue prints showing the differences in the application of Canadian and American mining laws. He compared a map of a Canadian camp and a map of the mining district around Butte, Mont. He pointed out the advantages in the Canadian system. He called attention to the fact that Rhodesia, in South Africa, is the only mining area in which the apex law applies outside of the United States. He stated, however, that Rhodesia is very anxious to rid itself of the apex law.

Mr. Channing is of the opinion that mining men throughout the country are agreed on the cardinal features which should be covered by revision. He said that the present law discourages prospecting and on account of this has a serious influence on the whole industry. He was the only speaker appearing before the committee to bring out the feature that the decrease in the amount of prospecting is bound to be reflected in increasing amount in the progress of the industry. Mr. Channing advocated a commission which should visit Alaska as well as parts of the United States. He thinks the commission should consist of five salaried men. He is not impressed with the necessity of having lawyers on the commission, as he considers that legal talent can be called in for framing the law.

### A YEAR NEEDED

Following Mr. Channing, J. R. Finlay, a mining engineer of New York, appeared before the committee. Mr. Finlay, who had charge of the appraisement of mining lands in Michigan for the State tax commission, made estimates of the expense that would be necessary to feel the public pulse in regard to revision of mining laws and as to the time that would be consumed. He thinks that a year of concentrated and systematic effort should be sufficient to have the matter in good shape. It is his opinion that the commission would have to spend six months in taking testimony and six months in adjusting their facts after their return. He thinks it would be difficult to get a proper commission without remunerating the members.

### WICKERSHAM SPEAKS

Judge Wickersham opposed the commission strenuously. He alleged that Mr. Ingalls, Channing and others are too closely connected with the copper trust to be above the suspicion of having ulterior purposes in wanting the mining laws revised. Extracts from his remarks follow:

This question of litigation is not such a serious matter as it used to be. So many great questions have been settled in the courts that it requires a mining expert now to evolve new questions,

**(Continued on page 87)**

# MANNING TELLS UNITED MINE WORKERS HOW THEY CAN HELP REDUCE LIFE LOSS

## Head of Bureau of Mines Addresses Miners' Convention at Indianapolis—Makes Plea for Cooperation in Bringing Greater Safety to Those Who Work Underground

Addressing the United Mine Workers of America in Indianapolis, January 26, Van H. Manning, Director of the United States Bureau of Mines said, in part:

I am here to give you my pledge of the very best there is in me to the cause of reducing the number of deaths in the mines. All I ask is that you continue the cooperation you gave Dr. Holmes, as I know you will. You perhaps realize, better than many others, the futility of trying all alone to accomplish something worth while. You know that in union there is strength: the achievements of your great organization bespeak that knowledge. In the same way, the Bureau of Mines needs your cooperation, needs the cooperation of the operators, needs the cooperation of the state mine inspectors. That it has had all this cooperation is shown in the improvement that has already been made. The results, I am happy to state, are now beginning to show in a substantial manner in decreases in the number of lives lost in coal mining.

### LATEST FIGURES

While I do not as yet have the complete fatality figures for the year just closed, I have every reason to believe that they will show the smallest number killed in any year since 1907, and the lowest death rate for every 1,000 men employed since 1900. The improvement during the last three years, I might say, has been remarkable. We have already collected the figures for eleven months of 1915, and from what we know of December the indications are that the deaths for the entire year will number about 2,200. Compare this with 2,785 deaths in 1913 and 2,454 in 1914.

In all mining in the United States, coal mining, metal mining and quarrying, the total number of deaths in 1913 was 3,651. In the year 1914 this was reduced to 3,193, showing a saving of 458 men to their wives and families in 1914. This improvement is quite marked in the death rates. In 1913 there were three and a half men killed in every 1,000 men employed. In 1914 this had been reduced to slightly less than three and one-sixth men in every 1,000 employed. Putting these figures more plainly, in more than a million men employed in all mines and quarries, one man was saved in every 3,000 employed in 1914. With the rather good showing of the coal mines in 1915, we expect that the total death rate for all mining for the year will be considerably reduced over the year 1914.

### USE OF THE CANARY

Mining is a blending of the scientific with the practical. The practical miner knows by experience the deadly danger of the gases found in the mines, but it takes the chemist with his delicate instruments and his trained, expert knowledge to find out some things about gases, vital to the welfare of the miner, that the miner never has the opportunity to learn in the pursuit of his daily task. An extreme illustration of this is the use of the canary bird at disasters for detecting poisonous gases. The bureau uses these birds to insure the safety of volunteer rescuers who may have pressed far into an explosion-wrecked mine in the hope of helping out any miners who have survived. As long as the canary is able to sit upon his perch, the volunteer party is entirely safe as to poisonous gases. If the canary bird falls, it serves as a warning and the rescue party generally has time to retreat to a place of safety, for a man can live for many more minutes in a gas-filled atmosphere than a canary. Until the bureau made experiments with these birds the miner had no way of knowing whether or not the canary would be practical for this purpose. That is one of the scientific things that we ask him to take for granted, as we have had the opportunity and we have tested the bird's

**PRINCIPAL POINTS IN MANNING'S ADDRESS**

1

Pledges best efforts to reduce loss of life in mines.

2

Estimates loss of life in mines in 1915 at 2,200. Gives other important unpublished figures.

3

Points out why miners must have respect for the scientific as well as the practical.

4

Sees in workmen's compensation a great instrument of good.

5

Tells how the number of mine accidents may be reduced to the minimum.

ability along this line until we do know what he can do.

We feel that it is a part of our duty to solve those problems that the laboratory only can solve and give out the conclusions in the hope that here and there we may be able to save the life of some man who might be a victim of his own inability to know.

At Hanna, Wyo., several years ago, before we began our modest efforts to try to save life, forty brave men who hurried into a mine to save sixteen who had been entombed by an explosion might not have lost their lives had they known about the efficiency of the canary bird, for those men rushed into a deadly atmosphere of poisonous gas.

### AS TO RESPONSIBILITY

The coal mines recruit a large new army of foreign workmen each year in order to keep pace with the rapidly expanding business. These men have perhaps never been in a mine before and it is all wondrously strange and intricate to them. Many of them have come from countries that do not have much coal mining, and most of them come from the sunny fields of agriculture of Europe. What they need, and before an accident happens, is careful instruction concerning safety rules and principles as related to mining. A careless management and new men unfamiliar with coal mining are the best combination I know to bring upon disaster.

In the education of these men to be miners, I know of no organization that could accomplish more practical good than the United Mine Workers of America. There is no better way than the frequent meetings of groups of miners as seen in your many locals in almost every mining camp in the country. You not only can discuss the problems that are peculiar to your own mining camp, the problems that arise from day to day, but you are brothers in a common danger and can give to each other that touch of human fellowship and sympathy that makes the lessons of wonderful value.

It is in this sort of work that the Bureau of Mines wishes to help you. It is for this reason that the Bureau, through the sanction of Congress, is printing the series of miners' circulars that tell about the dangers of mining and how they may be avoided.

### A NEW DISPENSATION

Within the last few years there has come a new dispensation, a realization that each industry should bear its proportionate hazards and that the widow and the children shall be cared for without making them subjects of public charity. And while workmen's compensation laws do not come within the function of the Bureau of Mines, I do believe that our propaganda for "Safety First" has had a tremendous influence upon the passage of laws in many States that provide for the proper keeping of the widow and her children, and the care and compensation of the injured.

Today thirty-one States have workmen's compensation laws, the year just closed seeing new legislation in Alaska, Colorado, Indiana, Montana, Oklahoma, Pennsylvania, and Wyoming. One year ago a compensation law went into effect in West Virginia, one of the great coal-mining States of the Union, as you know. Imagine the great step forward in such a law as that. If a miner is killed the State pays not to exceed $75 funeral expenses; to the widow $20 a month and $5 additional for each child under age; to orphan child or children, $10 a month and so on. In West Virginia last year there was one accident that cost the lives of more than 100 men. Can you even estimate the amount of human suffering and human degradation that has been avoided in that one community by such a State law?

The greatest triumph for the miners in this direction, however, is in the State of Pennsylvania, the greatest coal-mining State in the entire world, employing an army of 364,000 miners, half of the total number in the United States. On January 1 of this year a workmen's compensation law went into effect in that State which I think will provide adequately for the widows and orphans and other dependents of miners who are killed in accidents and also for the miners themselves who may be either slightly injured or totally disabled.

It's a big step forward toward the principle of brotherhood of man—the principle we are all striving for.

### PREVENTION OF ACCIDENTS

As a general statement, it may be said that there should be more stringent laws concerning the operation of mines; rigid rules and regulations on the part of the mining companies; a strict enforcement of the laws and regulations by State inspectors, operators and employees, with penalties for all who violate them, whether he be operator or employee. The education of the miner to realize the danger under which he works will have much to do with accident prevention. A common language, that is a language understood by both foreman and miner, is of prime importance. Improved safety methods and appliances will reduce the dangers incident to the industry. Among these may be mentioned the general use of safety lamps; the marking and guarding of all dangerous places, as shafts, winzes, chutes and other openings in the mines; a systematic inspection of all working places for gas, ventilation and roof conditions; safeguarding of machinery and electric wires; the employment of shot-firers, or, better yet, electrical firing apparatus, and shooting only when all men are out of the mine; the use of permissible explosives; the cooperation of State and Federal organizations with operators' associations, labor organizations, operators and employees; and, last but not least, eternal vigilance on the part of all.

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## Asks Resurvey

Senator Thomas, of Colorado, in behalf of the Silverton Commercial Club, has requested the United States Geological Survey to resurvey the Silverton quadrangle. This quadrangle contains 2,200 patented claims. This area is rapidly increasing in importance as it is the source of a considerable output of tungsten ore.

# SIXTEEN NATIONAL ORGANIZATIONS FORM HOLMES SAFETY-FIRST ASSOCIATION

## Hold Meeting in Washington Under Direction of Hennen Jennings and Discuss Plans for Perpetuating Memory of Man Who Started Safety First Movement

Representatives of sixteen national bodies interested in establishing a memorial to the late Dr. Joseph A. Holmes, met in Washington, January 15, and made plans for the establishment of a permanent memorial. The preliminary organization of the "Joseph A. Holmes Safety-First Association" was perfected.

In the meeting January 15, the following resolutions were adopted:

*Whereas*, It is the sense of this meeting that a suitable memorial be established to honor the memory of the distinguished humanitarian and scientist, Dr. Joseph A. Holmes, therefore be it

*Resolved*, First, that each national body or society here represented and others that desire to be represented be requested to approve a permanent organization or incorporation to be known and named "The Joseph A. Holmes Safety First Association," and that each such national body or society shall appoint one representative to act with other representatives in such permanent organization.

*Resolved*, Second, that a meeting be held of the duly appointed representatives at the Bureau of Mines building, Washington, D. C., on March 4, 1916, at which a permanent organization is to be effected.

*Resolved*, Third, that pending the formation of a permanent organization the temporary officers continue together with two members to be appointed by the chair as an executive committee with authority to incur necessary expenses, and that the temporary officers be authorized and empowered to take all necessary action in furtherance of the purposes of the permanent organization.

*Resolved*, Fourth, that the proposed organization when so effected shall through its various members and organizations endeavor to collect sufficient funds to carry out the purposes of this association.

*Resolved*, Fifth, that each national body or society becoming a member of this organization shall select its representative and notify the temporary secretary of such membership and selection.

*Resolved*, Sixth, that the temporary organization commends to the permanent organization the annual award of one or more medals which, together with honorariums, shall be termed "The Holmes Award" for the encouragement of those originating, developing, and installing the most efficient "safety first" devices, appliances or methods in the mineral industry and also special medals for the recognition of personal heroism or distinguished service in the mineral industry. However, further suggestions are invited from the organizations to be represented in this association.

The next meeting of the J. A. Holmes Safety First Association will be held March 4 at the Bureau of Mines. An executive committee, composed of temporary officers of the Association, has been formed, as follows:

Hennen Jennings, chairman; Van H. Manning, vice-chairman; George S. Rice, secretary. J. A. Finlay and Samuel Gompers are other members of the executive committee.

The following national bodies were represented at the meeting by the following:

The American Institute of Mining Engineers, Hennen Jennings and Van H. Manning; The American Mining Congress, Dr. David T. Day and Dr. Joseph Hyde Pratt; American Federation of Labor, Samuel Gompers; United Mine Workers of America, William Green; Mining and Metallurgical Society, Dr. George Otis Smith; American Society of Mechanical Engineers, Gen. W. H. Bixby; American Institute of Electrical Engineers, John H. Finney; American Electro-Chemical Society, Dr. F. G. Cottrell; National Safety Council, George S. Rice for H. M. Wilson; American Association for the Advancement of Science, Dr. L. O. Howard; American Chemical Society, Dr. S. S. Voorhees; Geological Society of America, Dr. Charles D. Walcott and Nelson H. Darton; National Academy of Sciences, David White; American Red Cross Society, Major Robert U. Patterson; American Forestry Association, William L. Hall; Natural Gas Association, Thomas C. Jones.

## WICKERSHAM MAKING NOTABLE COLLECTION OF BOOKS ON ALASKA

James Wickersham, Delegate from Alaska, is making a collection of books dealing with the Territory. He already has collected 5,000 books and magazines.

It is his intention to turn over this collection when completed to some library or educational institution in Alaska.

The work of collecting books and keeping track of current publications of interest to Alaska, as well as the indexing of them, is in the hands of G. A. Jeffery, Mr. Wickersham's secretary, and Hugh A. Morrison, of the Library of Congress.

## ORIGIN OF JOPLIN ZINC AND LEAD ORES DISCUSSED

Lead was discovered and mining begun in southwestern Missouri in 1848. Some zinc ores must have been found with the lead ores from the very first, but at that time they had no value as all the zinc smelters, were in the eastern part of the United States. In 1867 and 1869 zinc works were established at St. Louis and zinc mining became profitable. The production of zinc ores soon became equal to that of lead ores and has ever since been an active industry in that region and in the adjoining parts of Kansas and Oklahoma.

The region, generally known as the Joplin district, has been the subject of a number of geological investigations. Geologic surveys of the district were made by the State of Missouri in 1870, 1874, and 1894, and a survey of the Granby area was made in 1907. Surveys were made by Kansas in 1907 and by Oklahoma in 1912. The Federal Government surveyed the region in 1893, 1901, 1907, and a report on a survey of the Wyandotte quadrangle lying partly in the northeastern corner of Oklahoma and partly in Missouri is now in preparation by C. E. Siebenthal of the United States Geological Survey. In studying the ore deposits of this area, Mr. Siebenthal reached certain conclusions regarding the genesis of the ores which are somewhat at variance with those reached by some other investigators but are in general confirmatory of the findings of the United States Geological Survey's earlier work.

In these investigations, the original source of the metals has generally been the subject of much speculation and study. Analysis of large quantities of material have shown the general presence of measurable quantities of lead, zinc, and copper in the pre-Cambrian crystalline rocks, in the Cambrian and Ordovician limestones, and in the Mississippian limestones, and it is also known that the Pennsylvania shale in a few places carries appreciable quantities of lead and zinc. These rocks comprise all the geologic groups that make up the Ozark Uplift, and each group has been considered the immediate source of the metals by one or more writers on the geology of the ores.

The Government reports of 1901 and 1907 expressed the view that the metals were derived in whole or in part from the Cambrian and Ordovician dolomitic limestones from which they were brought up by an artesian circulation and deposited in openings in the Mississippian limestones. The present report, the result of several years' study, likewise holds that the ores were deposited by ascending artesian solutions which derived the metals chiefly from the Cambrian and Ordovician limestones.

Among the items of evidence cited in support of this view is the fact that natural waters of the type found in the deep wells of the Joplin district commonly carry zinc as well as lead and other metals. A large number of analyses of such waters are given, among them several analyses of waters from deep wells in the Joplin district or from the region in Kansas and Oklahoma bordering the Ozark Uplift. These wells draw their supply from the Cambrian and Ordovician limestones and their waters not only carry traces of zinc and lead, but when they are allowed to stand in tanks or reservoirs for a while they deposit a sediment that shows considerable proportions of these metals. The sediment from a waterworks reservoir in Kansas showed a total of 8 pounds of zinc sulphide which had been deposited in a year.

Other evidence is afforded by the relation of the ore deposits to the present distribution of the Chattanooga shale. This shale covers the Cambrian and Ordovician formations over a part of the Ozark Uplift and acts as a septum between these rocks and the Mississippian above to prevent the ascent of solutions from below. Over the area underlain by this impervious shale there are no ore deposits.

Much other evidence in showing that the ores were deposited by ascending artesian water is presented in a report just published by the United States Geological Survey as Bulletin No. 606, which may be had free on application to the Director, at Washington, D. C.

## DEVIL'S TOWER, IN WYOMING, IS AN INTERESTING FREAK

Devil's Tower, in Wyoming, a cut of which appears on the cover of this issue, is a huge shaft of igneous rock on the bank of the Bellefourche River, north of the Black Hills, in the central part of Cook County. It is far from settlements, but is dimly visible from the Burlington Railway, forty miles distant.

It rises nearly perpendicular, 600 feet from the top of a mound. The mound itself is 600 feet high. The base of the mound is cut by the river, exposing high cliffs of sandstone of a brilliant red color.

The great tower is 200 feet in diameter at the top, and tapers somewhat to its base. It is of porphyry, with a vertical columnar structure resembling a huge bunch of organ pipes. This gives to the sides a most novel flutted appearance.

Some years ago an adventurous visitor drove 100 or more wooden pegs in a crack, and by this means reached the summit.

Moulten rock, pouring from the interior of the earth through a sandstone crack, was the cause of this strange freak.

## MANNING CONFERS WITH OPERATORS AND OPERATIVES

On his recent trip to the Middle West, during which he addressed the United Mine Workers' convention at Indianapolis, Director Manning, of the Bureau of Mines, attended a meeting of mine operators and workers in Chicago. He addressed them informally.

Mr. Manning also conferred with the Illinois Mine Rescue Commission on matters pertaining to the mine-rescue and first-aid work.

*Photograph by J. S. Diller.*

BULLY HILL SMELTER.

Plant which has been closed since 1910, owing to a smoke controversy. Encouraging results are being obtained in the Bully Hill region in experimental treatment of zinc and copper by the wet process. This eliminates the smoke, and it is expected that this important plant will be able to operate again in the near future.

## NEW ORE BODIES ARE DEVELOPED NEAR KINGMAN

At the request of the American Institute of Mining Engineers, F. C. Schrader, of the United States Geological Survey, has given them for publication an article on the Mohave County mining district of Arizona. Mr. Schrader has given particular attention to the mining districts around Kingman.

He regards recent development in the Great Eastern and the Big Jim mines, where substantial ore bodies have been opened up at depths of 500 feeet, as of the greatest importance in establishing the exceptional worth of this mining region.

Continuing development in the Tom Reed mine gives added proof of the value of the deposits in the Mohave County district, Mr. Schrader believes.

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### New Firm Formed

Announcement was made January 17 of the formation of the firm Hall & Paul, consulting engineers and chemists.

The members of this firm will do consulting engineering work and furnish advice pertaining to safety, efficiency and economy in coal-mine operations and the safe and proper use of explosives in mines and quarries.

Special attention will be given to reports on coal properties and operating mining plants.

Clarence Hall is the chemical engineer and James W. Paul the mining engineer of the firm.

## SLEDGE TATUM, OF GEOLOGICAL SURVEY, DIES SUDDENLY

After enjoying the position of chief geographer of the Geological Survey for less than a month, Sledge Tatum died last month from stomach trouble.

Mr. Tatum was born at La Grange, Ga., in 1873. He was educated there and had the honor of being one of the youngest representatives ever sent to the State legislature. In 1895 he entered the Government service as a surveyor in the Indian Territory. In 1901 he came to Washington, being detailed in the local office of the Geological Survey. He has lived here since, with the exception of the four years from 1906 to 1910, which he spent in the Panama Canal Zone for the Government.

Mr. Tatum is survived by his widow.

The funeral was held in Washington. The honorary pallbearers were: Van H. Manning, W. H. Herron, Thomas Riggs, Frank Johnson, W. J. Peters, and W. C. Mendenhall.

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## INTERESTING DEVELOPMENT IN HARDER'S WORK

Interesting developments are being attained by E. C. Harder, of the United States Geological Survey, who is making a study of the iron ore deposits in the Cayuna district of Minnesota.

He is engaged in a laboratory investigation as to the action of bacteria in deposits of iron ore. Many interesting features of the action of these minute organisms in extracting iron from natural solution, and accumulating it in sufficient quantities to form ore bodies, are being developed.

## BIG OPERA HOUSE OPENED IN ISOLATED MINING CAMP

The Raleigh Coal and Coke Company, of Raleigh, W. Va., began a new chapter in coal mining history when an opera house seating 1,000 persons was opened. President John M. Wright, accompanied by Mrs. Wright and A. A. Liggett, secretary of the company, were present to see the big event.

The opera house is situated in the heart of the mountains.

The significance of the event is that a great corporation is opening the doors of education, art, science and literature to workers, binding them by the great ties in common brotherhood.

The miners will take over the opera house as a business enterprise, work out its success and their own destiny at the same time. The company built and equipped the house and now turns it over to the Raleigh Mining Institute, an organization of the miners and employees and officials, to operate for the benefit of all. This welfare work has scored the greatest success. The opera house will be conducted by an executive committee of the institute to make it self-sustaining. A sinking fund to be used in the redemption of the opera house from the company will be provided.

The committee, comprising an officer of the company, aided by the sons of miners, will compete with two other executive committees of the institute. These young men have managed the institute work so effectively that it is paying for itself. Lectures, picture shows, study and discussion of mining problems and social questions have made these young mountaineers self-reliant, able, skillful and capable of doing things. The executive committee projected and secured a fine, large baseball park, which the company paid for, equipped and turned over to the committee last spring. This ball park was expected to sustain itself.

There are three bands among the employees of the company.

The Raleigh Coal & Coke Company owns and operates six mines on Paint Creek, employs approximately 1,000 men, sustains and helps some 6,000 people in Raleigh, furnishes amusement and entertainment, instruction and fine ideals and ambitions to the town of Beckly near by, and makes a market for a large farming population throughout that section of the State The Mining Institute is composed of 200 brawny and brainy young men clerks, officials and miners. The company has built a garage with thirty-two stalls for automobiles owned by miners. A library and two churches, one for the colored population and one for the white, are sustained. Good schools are furnished and the people are taught to sustain themselves and educate themselves and carry on their own municipal and home affairs.

## DIRECTOR SMITH SPEAKS ON INTEREST IN WATER POWER

The people's interest in water power is served only through use, said George Otis Smith in an address on the nation's water-power resources before the Pan-American Scientific Conference. Continuing, he said:

Since flowing water is a continuing source of power the contribution of this resource to the public welfare is proportionate to the promptness and efficiency of the development of every power site. Wherever the resulting energy can be put to work at a cost justified by results nonuse of a water power is an economic waste. It is well, however, to qualify the statement of an eminent authority that from the conservation standpoint "any use is better than no use at all." A more far-sighted view is desirable; better not even a partial development now if thereby the full utilization that may be needed in the near future is blocked.

From the standpoint of the public what is needed in water-power utilization is efficient development that will meet present market demands and effective regulation that will secure to all the parties interested a participation in the benefits of that development. This may seem a simple program, but its large importance comes from the fact that water-power resources will possess much greater value to society in the future.

The stage at which we find power development on the public-owned sites today is simply this, as described by Secretary Lane in his recent report: "The Government was generous, but it had no intention of being a spendthrift. When it found itself being imposed upon . . . the nation stayed its hand and drew back, so as to make sure of the right course. It wished use —use by as many as possible and the best use."

Cheap power promises to be in some future century this country's largest asset in the industrial rivalry among nations. Our unsurpassed coal reserves reinforced by these water-power resources constitute a strong line of national defense in that they form the real basis for an industrial organization of the nation's workers. It is only through abundant and well-distributed power that the other material resources of the country can be put to their highest use and made to count most in the nation's development. The people's interest in water power is greatest in its promise of future social progress, and such an interest is well worth protecting.

## SURVEY GETS $100,000 IN URGENT DEFICIENCY BILL

The urgent deficiency bill carried $100,000 for the Alaskan work of the Geological Survey. This is in no sense a deficiency but provides for expenses in the Alaskan work which cannot wait until the regular appropriation is available. It would be very much better if the money for all the field work in the Survey were available at the beginning of the calendar year rather than the fiscal year.

# SALT LAKE CITY GREATEST FLOTATION CENTER IN U. S., SAYS METALLURGIST

## Declares Hub of Western Mining Is Now Utah City Instead of Denver—Bureau of Mines Station Making Headway with Work on Low Grade and Complex Ore Problems

Salt Lake City, January 25.—Statistical studies by the Department of Metallurgical Research of the State School of Mines of the University of Utah, which is working in co-operation with the Salt Lake City Station of the United States Bureau of Mines as to the distribution or ores and the location of smelters in the western United States, has shown that Salt Lake City is near the center of production of most of the valuable metals, being almost exactly in the geographic center of western metal production.

For years Denver has been the actual commercial center for the manufacture of mining machinery and it is in Denver that a great many of the prominent consulting mining engineers and metallurgists have their offices. Salt Lake City being so much closer to the geographic center of the metal production and having railroad lines radiating in all directions, should be the logical mining center of the Western States, say Utah mining men. Several of the prominent mining supply houses have branches in Salt Lake City, but with the continued increase in the production of the mining and metallurgical industries, the natural condition of things should be the eventual moving of the headquarters of these companies to Salt Lake City, they say. A prominent metallurgist states that Salt Lake City is probably the greatest flotation center in the United States, already having three organizations whose contributions to the art of floating minerals have been larger than almost any other one district in the country. Technical men have come considerable distances to visit these three institutions, which are the General Engineering Company, which is exploiting the Callow flotation machine; the Utah Copper Company, which is exploiting the Janney flotation machine, and the Department of Metallurgical Research of the University of Utah, under the direction of the local station of the United States Bureau of Mines, which is conducting research work on flotation problems vital to the industry in general.

### MAY GET LABORATORY

One of the things investigated while in the East by D. A. Lyon, metallurgist in charge of the Salt Lake City office of the United States Bureau of Mines, at the University, was the offer of one of the largest electrical manufacturing companies to establish an electro-metallurgical laboratory in Salt Lake City, either in charge of the local station of the Bureau of Mines, or else closely connected therewith, to study methods of applying electricity in metallurgy, especially for electric furnaces and for electrolytic methods for depositing metals from solutions. It is very well known that in the West there are many hydro-electric power plants which have already developed hydro-electric power or could do so, for which they would like to find a market. Power delivered to small consumers for the purpose of lighting houses and cooking is subject to a high cost of distribution, while power delivered in large blocks to metallurgical or chemical plants can be produced at a very small fraction of what it costs the small consumer. It is known that an electric horsepower along Snake River in Idaho can be generated for about $10 a year under the most favorable circumstances. Montana, Utah, Colorado and Washington have very promising power sites which might very well be utilized in the treatment of complex ores if methods can be worked out for them. Mr. Lyon is now looking over the situation in the West to see if he can recommend to the company in question problems of sufficient magnitude and promise for them to install a laboratory in Salt Lake City.

### WORK WITH ORE PROBLEMS

Three of the staff in the Department of Metallurgical Research of the State School of Mines at the University, which department is working in cooperation with the Salt Lake City station of the United States Bureau of Mines, are at work on the treatment of the low-grade and complex ores of the State. This is a very timely subject, as the average amount of zinc in the ores of lead, copper, silver and gold which are now going to the smelters is quite large.

Zinc is a valuable metal and yet the shippers of ores of other metals who are unfortunate enough to have zinc also present in their ore are never paid for it. In fact, they are penalized for the zinc content of their ores. Here is an opportunity to turn a loss into a profit by removing the zinc from these ores before they go into the smelters, and selling the zinc removed.

The method used is to roast the sulphide ore and then treat with a solution of sulphuric acid. Oxidized ores do not require the roasting. The zinc is thus dissolved out of the ore and can be recovered from the solution by the application of the electric current, giving a product that contains fewer impurities than the ordinary kinds of zinc and which is especially adapted to brass making. Sulphuric acid can be made from the smelter fumes which are now going to

waste and often causing damage to the farms in the immediate vicinity of the smelters.

Members of the Salt Lake City station of the United States Bureau of Mines, who are directing the above work, presented the problem at the Salt Lake meeting of the A. I. M. E. a little over a year ago, and a lively discussion followed. Since then one of the smelters near Salt Lake has experimented with the process proposed and is now building a plant to apply it. A number of smelters outside of the State have also taken up the idea and the method bids fair to become an important factor in western metallurgy and mining.

TO BUILD ACID PLANT.

Announcement was made by C. W. Whitley, General Manager of the American Smelting and Refining Company, at Salt Lake City in December, that the first 100-ton unit of a sulphuric-acid plant would be built in the Salt Lake Valley at once and additional units added as needed. The exact location of the plant has not been announced, but it is believed it will be at Garfield, where the company has one of its Utah smelters.

A new company, in which the Utah Copper Mining Company and the American Smelting and Refining Company will participate, will be formed to build and operate the plant.

In an interview published at Salt Lake, Mr. Whitley says:

"We have not decided upon what process will be adopted. I can only say that it has been definitely decided that a plant will be built. The plans are now being made, and it will not be long before they are out.

"There are several processes that can be used and one of these will be decided upon. The plant will make various grades of acid, both for commercial use and for leaching of low-grade ores.

"We will have an expert acid man in charge and the plans are just beginning to take definite form. An appropriation has been made for the work and there will be no experimental work necessary.

"While in the east offers of contracts for sulphuric acid came from various sources and I could have made contracts for almost any figure. There is a great demand at present for acid."

STOPS SMELTER FUMES.

In speaking of the new plant, Col. D. C. Jackling, Vice-President and Managing Director of the Utah Copper Company, says:

"Our plans have not been completed and are still somewhat indefinite. Work will be started in the next few weeks and from then on the plans will progress.

"The Utah Copper will participate in the building of the plant and the making of acid will do away with the smelter fumes."

CARPENTER RESIGNS.

Announcement was made at Salt Lake City, December 31, that E. L. Carpenter, President of the United States Fuel Company, had tendered his resignation and expected to be relieved about February 1, or as soon as his successor had been named.

Mr. Carpenter is one of the best-known coal operators of Utah and has been prominent in developing the industry in that State since 1884, except for a few years when he was in New York, New Mexico and Boston, as an officer of various coal interests. He was with the Utah Fuel Company from 1884 until 1902 when he became manager of the New York office of the Consolidated Coal Company. He was general manager of the Phelps-Dodge coal interests in New Mexico from 1906 until 1909 when he went to Boston as assistant to the president of the United States Smelting and Refining and Mining Company. In 1912 this company bought the Castle Valley Coal Company, the Consolidated Fuel Company, the Black Hawk Coal Company, and later the Panther Coal Company, Mr. Carpenter being placed in charge of the combined companies as president. These companies were recently reconstituted as the United States Fuel Company, with Mr. Carpenter as president.

Mr. Carpenter as a member of the Utah Chapter of the American Mining Congress rendered valuable service in the organization of the Chapter and is at the present time its Second Vice-Governor.

As soon as Mr. Carpenter is relieved of his duties at Salt Lake he and Mrs. Carpenter will pass several months in visiting principal cities of South America.

## PRESIDENT ASKS COOPERATION OF MINING ENGINEERS

The President, under date of January 13, addressed the following letter to W. L. Saunders of the American Institute of Mining Engineers:

"The work which the American Institute of Mining Engineers has done through its members on the Naval Consulting Board is a patriotic service which is deeply appreciated. It has been so valuable that I am tempted to ask that you will request the institute to enlarge its usefulness to the Government still further by nominating for the approval of the Secretary of the Navy a representative from its membership for each State in the Union, to act in conjunction with representatives from the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, and the American Chemical Society, for the purpose of assisting the Naval Consulting Board in the work of collecting data for use in organizing the manufacturing resources of the country for the public service in case of emergency.

"I am sure that I may count upon your cordial cooperation."

## ENGINEERS NAME COMMITTEE ON REVISION OF LAWS

The Committee on Revision of Mining Laws of the American Institute of Mining Engineers appointed by President Saunders are: James R. Finlay, D. C. Jackling, Hennen Jennings, C. F. Kelley, and E. B. Kirby.

## NEW CHIEF GEOGRAPHER NAMED BY SURVEY

William H. Herron has been appointed acting chief geographer of the United States Geological Survey, to take the place of the late Sledge Tatum.

Claude H. Birdseye at the same time was appointed topographic engineer in charge of the Rocky Mountain division. Glen S. Smith has been given charge of the central division.

The new chief geographer is well known to mining men in many parts of the country. He is especially well known in Michigan, where, with State Geologist Allen, he has covered a considerable portion of the mining area of that State. He is also well known in Missouri, where he was associated with State Geologist Buehler in topographic work in the lead and zinc mining sections. In addition, Mr. Herron has made a large number of topographic surveys in Colorado and in the Black Hills section of North Dakota, where his work had an intimate connection with mining operations.

Mr. Herron was born in Monticello, Ill., November 20, 1865. His education was secured at Columbia University. He did his first work for the Survey July 1, 1885.

Among the more recent work in charge of Mr. Herron was the mapping of the Newcastle, Wyo.; Bonner, Mont., and Aladdin, Wyo., quadrangles.

In 1906 he had supervision of the northwest section of the eastern topographical division of the United States. The following year he became geographer in charge of the central section. In 1908 he was promoted to geographer in charge of the central division.

Mr. Herron is a member of the American Association for the Advancement of Science, Chicago Engineers' Club, and the Geographic Society of Washington.

### For Married "Booze" Fighters

*Mining World.*

To the married man who thinks he cannot get along without his regular drinks, the following is suggested as a solution to the bondage of his habit:

1st. Start a saloon in your own house.

2d. Be the only customer, and you will have no license to pay. Give your wife $2 to buy a gallon of whisky, and remember there are only 69 drinks in a gallon.

3d. Buy your drinks from no one but your wife, and by the time the first gallon is gone she will have $8 to put in the bank and $2 to start business again.

4th. Should you live ten years and continue to buy booze from her, and then die with snakes in your boots, she will have money enough to bury you decently, educate your children, buy a house and lot, marry a decent man and quit thinking about you.

WILLIAM H. HERRON

New Chief Geographer of the United States Geological Survey.

## JUDGE MORROW PRAISES SURVEY'S GUIDE BOOKS

Typical of the appreciation of the public of the guide books of the Geological Survey is the following letter from Judge William W. Morrow, of the United States Circuit court of Appeals at San Francisco. Judge Morrow says in a letter to Director George Otis Smith:

"I wish to report that I enjoyed my return trip home immensely. With your guide book to the 'Overland Route' in hand, I sat in the observation car from early morning to late at night, scanning the geological formation as it drifted by, reading the historical and industrial data relating to the stations and sections of the country, and generally making myself acquainted with the Overland Route, which I have passed over more than fifty times, but without acquiring much valuable information about it until this time.

"This guide book is splendid, and I have no doubt the others are equally meritorious. They are great books and ought to be in the hands of all the western travelers. They are educational and immensely interesting. I congratulate you upon this specially good work of your bureau."

## ACCUMULATED DATA OF SERVICE TO THE PUBLIC

The following extract from a Geological Survey letter shows how the Survey is able to assist the public by drawing on the information and data which it has accumulated during the thirty-six years of its existence. The letter in question is in response to an inquiry from a principal of schools as to the depth at which artesian water may be secured in a certain section of land on which he has filed a claim.

"The vicinity of Trinchera is covered by Geological Folio 58, the Elmoro Folio, which contains a discussion of the underground water and maps showing the artesian conditions in that vicinity. According to this folio water-bearing beds of the Dakota sandstone occur between 600 and 800 feet below Trinchera, at less depths to the northeast, and at greater depths to the southwest thereof. Wells drilled to this formation may not produce flows but may yield considerable water if they are pumped. The term "artesian" is used in this folio for wells in which the water rises under pressure, although these wells may not overflow at the surface."

## "USEFUL MINERALS" TO BE WORK OF MUCH VALUE

A large demand is anticipated for a forthcoming bulletin by the United States Geological Survey on Useful Minerals of the United States. The work on this report is about completed. It is being done by F. C. Schrader, who has put in more than a year's work on the volume.

This is the third bulletin of this character to be issued by the Survey. The one of two years ago has been greatly in demand, and copies available for distribution were exhausted shortly after issue.

The new bulletin will bring all matters treated in the former work up to date, and also will contain much additional information. It will point out in detail the influences which the war has exerted upon the minerals of the United States.

## PRELIMINARY BULLETIN ON TINTIC DISTRICT

An extensive report upon the Tintic mining district of Utah, by W. Lingren and J. H. Loughlin, of the United States Geological Survey, is ready for publication. As it will be some time before the complete report can be printed, a brief statement of results has been compiled and will be issued as a preliminary bulletin. It should be available about March 1.

**Information is the very foundation of all right action in legislation.—WOODROW WILSON.**

## PHILIPPINES PROFIT BY ABSENCE OF APEX LAW

Among the very earnest advocates of the abolition of the Apex law is H. C. McCaskey, head of the Mineral Resources Division of the United States Geological Survey.

Mr. McCaskey was formerly the head of the Mining Bureau in the Philippine Islands where vertical end and side lines determined the boundaries of claims.

It was Mr. McCaskey's experience in the Philippines that American operators and prospectors when they first began work in the Philippine Islands were hostile to the mining regulations and clamored for the Apex law and other regulations to which they had been accustomed in the United States. But he found that in a very short time they became accustomed to the different regulations, and soon were enthusiastic supporters of the vertical boundaries.

The Philippine Islands were given mining laws in an Act of Congress, No. 235, approved July 1, 1902. The law provided for vertical end and side lines as marking the boundaries of claims, and made various other changes in the laws which govern Continental United States. As a result there has been very little litigation.

The principal objection to the mining code as applied to the Philippine Islands is the greatly restricted limitation on the number of claims that may be held on any one vein.

## BUREAU OF MINES TO CHANGE STATION TO GOLDEN, COLO.

The Bureau of Mines station at Denver will be moved to Golden, Colo., on or before July 1. Arrangements have been completed whereby the Bureau of Mines and the Colorado School of Mines will cooperate in experimental work. This arrangement will do away with certain duplications of effort that have existed.

The contract making possible this arrangement was signed in Washington late last month by Van H. Manning, director of the Bureau of Mines, and by William B. Phillips, president of the Colorado School of Mines.

The School of Mines will allow the use of its engineering hall, experimental mill, testing plant and laboratory. The Bureau of Mines will move its Denver equipment to Golden and will add some new apparatus. The work will be conducted by the employes of the Bureau of Mines and under the sole direction of the Bureau.

Recovery of values from low grade and complex ores will be the chief object of the research work. It will be confined largely to studies of Colorado ores.

# SAFETY-FIRST WEEK IS TO BE OCCASION OF GOVERNMENT EXPOSITION

## Secretary of the Interior Makes National Affair of Inter-Bureau Exhibit of Safety Devices—State Mine Inspectors To Meet in Convention While Exhibition Is In Progress

"Safety-First" week, February 21–26, is to be made an important event through the co-operation of various federal bureaus.

Every bureau having jurisdiction over any feature of safety or conservation work will have an exhibit showing in detail the work it has in hand. This exhibition will take on a national aspect, as manufacturers and operators from all over the country are invited to be present, in order that they may see what the Government of the United States is doing in "safety-first" work.

The Bureau of Mines will have one of the largest exhibits. It will have 700 square feet of floor space devoted to mine-rescue apparatus and other exhibits which will show the class of work it is conducting and the success which is attending its efforts.

The idea of "Safety-First" week originated in the Bureau of Mines. Director Manning thought well of the plan and laid it before Secretary Lane. Mr. Lane thought it an excellent idea, and in addition to the exhibits, he suggested that it be made the occasion of a gathering of all state mining inspectors, and others who are interested in first-aid work and in the conservation of life and health.

As a result Mr. Lane sent to the Governors of each State in which mining is conducted, asking that they send the state mine inspector to Washington during "Safety-First" week, and in addition send another representative of some state activity having an interest in the subject.

President Wilson is much interested in the success of the activities planned for the week and has written Mr. Lane as follows:

"Thank you for calling my attention to the proposed Safety-First Exposition by various Federal bureaus to be held at the Smithsonian Institution from February 21 to February 26. I sincerely hope that I can find an opportunity to be present on one of those days. Particularly at this time it is wise and wholesome that the Federal Government should call the attention of the people of the country to what the Government is doing to preserve life, the greatest of all the resources of the nation.

"The rescuer of the Bureau of Mines who braves the poisonous gases of a mine and saves a miner from death; the coast guard who at the peril of his own life saves the passengers of a helpless vessel from death; the surgeon of the Public Health Service who stops a dreaded scourge in its incipiency and saves thousands of lives; the engineer who succeeds in reducing the hazards of his industry to its men; and the man who brings about better conditions of living among the people, I consider all types of the hero who will be most regarded in the near future.

"The Federal Government is doing an exceedingly helpful work along just such lines and I doubt if the public appreciates how extensive and important that work is. I especially like your idea of making this as much as possible a national affair. Every manufacturer, every railroad man, every miner, every operator, every workman, and every humane person in the country ought to be interested. I sincerely wish you success in this undertaking."

The exhibition is in charge of a committee headed by Major William Lyster, of the Army Medical Corps. Morton F. Leopold is the secretary of the committee.

The bureaus concerned and the men who will be in charge of the exhibition are as follows:

Department of Commerce—W. J. Canada, Bureau of Standards; W. F. Peabody, Coast and Geodetic Survey; H. B. Bowerman, Bureau of Lighthouses; C. C. J. Norris, Steamboat Inspection Service; W. D. Terrell, Bureau of Navigation.

*Navy Department*—This department has four bureaus taking part and has requested the amount of 600 square feet for their combined exhibit.

*Department of Agriculture*—Benjamin C. Kadel, Weather Bureau; C. A. Lindstrom, Forest Service.

*Department of Labor*—Lucian W. Chaney, Bureau of Labor Statistics; Miss H. Summer. Wall space only desired.

*War Department*—Major William Lyster, Army Medical Corps.

*Treasury Department*—Asst. Surg. Gen. W. C. Rucker, Public Health Service; Lieut. H. H. Wolf, Coast Guard Service.

*Department of the Interior*—M. F. Leopold, Bureau of Mines; W. S. Deffenbaugh, Bureau of Education; R. B. Dole, Geological Survey; C. F. Hauke, Indian Office.

*District Government*—Major Raymond Pullman, Superintendent of Police, Washington, D. C.

# Latest Legal Decisions

### INTERSTATE CARRIAGE OF COAL

The act of 1906 (34 Stat. 585) does not forbid a railroad company holding stock in a coal mining corporation, if such corporation be a bona fide organization; and coal mined and produced by such a corporation may be lawfully carried by a railroad company although such railroad company is a stockholder in the mining corporation; and this is true without regard to the extent of the railroad's stock ownership, whether a part or the whole; but under such circumstances the railroad company must not use the power given by such ownership to obliterate the distinction between the two organizations and must not exert its power so as to comingle indistinguishably the affairs of both and thus cause the two corporations to be one for all purposes and it must not destroy the entity of the producing or mining corporation and thus make the two virtually one; and if it actually do those forbidden things, then the commodities' clause applies and condemns as unlawful such abuse of a lawful right. The fact that the capital stock of a railroad company and of a coal company was owned by a holding company and the coal mined by the mining company was carried by the railroad company is not an offense against the commodity clause of the statute where it is made to appear that the railroad company did not mine or produce the coal transported for the coal company, and where the railroad company did not own or have any interest, direct or indirect, in the coal transported.

United States *vs.* Reading Co., 226 Fed. 229, p. 273.

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### COMBINATION OF COAL COMPANIES

A combination by which a holding company, already the owner of the capital stock of a railroad company and of a coal company, purchased the majority stock in another railroad company which owned practically all the stock of another coal company, where it appears that the two railroads have been carrying anthracite coal of these two large producers to the same markets where the coal has been sold in competition and where it appears that these two carriers transport practically one-third of the total tonnage of anthracite coal carried by the railroads that reach the anthracite field, and the two coal companies dispose of more than 20 per cent of all the anthracite coal sold on the market, is a union of the two companies in the same ownership that creates a combination in restraint of interstate trade in violation of the Sherman anti-trust act.

United States *vs.* Reading Co., 226 Fed. 229, p. 271.

### LIABILITY FOR INJURIES

The mining act of Pennsylvania does not relieve the owner or operator from liability for his own neglect or failure of duty and there may be cases in which both the mine foreman and the mine owner may be liable to an injured miner. Thus if through any neglect or failure of duty the mine owner causes an injury to one of his employees the general rule applicable in such case subject the owner to damages for such default; or if there is a dangerous condition existing in the mine which is permitted by the negligence of the mine foreman, resulting in injury to an employee, the mine owner will be responsible if he has knowledge of the fact and takes no steps to remove such dangerous condition, as the owner cannot neglect this duty and escape responsibility as the statute requires the owner to use every precaution to insure the safety of the workmen in all cases, whether provided for in the statute or not.

Barnes & Tucker Coal Co. *vs.* Vozar, 227 Federal, 25, p. 29.

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### DEGREE OF CARE REQUIRED

Ordinary care may be defined to mean such care as is usually exercised by ordinarily careful and prudent persons under like or similar circumstances to those involved in a particular case.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

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### NEGLIGENCE DEFINED

Negligence may be defined to mean the failure to exercise ordinary care, or such care as is usually exercised by ordinarily careful and prudent persons under like or similar circumstances to those involved in the particular case.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

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### GROSS NEGLIGENCE DEFINED

Gross negligence may be defined as a failure to exercise slight care.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

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### NOT AN OFFENSE

The fact that the coal land holdings of a coal company are large and that the coal company ships and sells the largest per cent of all the anthracite coal that reaches the market, is not alone sufficient to constitute an offense against the Sherman anti-trust act, in the absence of any showing of harm or injury. Under such circumstances but three classes of persons could be injured: (1) rival producers on a large scale who

might be injured by unfair methods of competition; (2) smaller producers who might suffer by similar methods; and (3) the consumer who might suffer by extortionate prices. But in the absence of proof that either of these classes of persons has sustained injuries, the charge of unlawful competition or restraint necessarily fails.

United States *vs.* Reading Co., 226 Fed. 229, p. 268.

MINING-TAXES

While under no allegation of general ownership a party, either plaintiff or defendant, may prove the character of such ownership by proving adverse possession and payment of taxes, yet however general the pleadings in that regard may be in case the surface ground of a mining claim is not questioned, the evidence and findings upon the question of payment of taxes should be direct and specific, and it should be found whether merely surface possession together with improvements is claimed, or whether the title to the whole claim is asserted; and in either event the assessment and payment of taxes should be shown and found so that a court may determine the relative rights of the surface and mineral owners.

Utah Copper Co. *vs.* Exkman (Utah), 152 Pacific, 178, p. 180, October, 1915.

KNOWLEDGE OF DANGER

A miner in an action for personal injuries is entitled to have his case submitted to the jury where his injury was caused by the breaking of a jack pipe furnished him by the machine boss, where the miner knew the pipe was rusty and to the use of which he objected but was assured by the mine boss that it was good for two or three months, and that he, the boss, knew better than the miner, and where the superintendent assured the miner that the machine boss would see that a new pipe was furnished and directed him to go on with the work until a new pipe was furnished, though the testimony of the injured servant was contradicted by both the machine boss and the superintendent.

Keystone Coal & Coke Co. *vs.* Petrovich, 227 Federal, 43, p. 45.

COMPROMISE CLAIM

A widow whose husband was killed in a mine because of the alleged negligence of the mine operator, and who waived the right to take out letters of administration and administer upon the estate of her husband and sue for the wrongful death, may after the appointment of a third person as administrator compromise and settle the claim against the mine operator for damages because of the alleged negligence resulting in the death of her husband, and a receipt and release executed by her in payment, settlement and compromise of such claim may be pleaded in bar of an action brought by the administrator. It is immaterial in such case that the administrator was appointed before the widow effected the compromise, and the result is not changed by the fact that she consented to the appointment of the administrator, as her superior right to control the claim by compromising it, or by bringing suit on it herself, can be in no wise impaired by the qualification of the administrator and her superiority continues until she in some manner waives it and the waiver of her right to administer is not tantamount to a waiver to her right to sue or to settle, though this power may in fact be exercised to the detriment of her interests. The settlement made by the widow cannot be impeached by the administrator on the ground that it was fraudulently procured, as the widow alone could take advantage of any alleged fraud.

Spitzer *vs.* Knoxville Iron Co. (Tennessee), 180 Southwestern, 163, p. 164, November, 1915.

CONDITION OF MACHINERY

In an action by a miner for injuries caused while cutting coal and due to the alleged defective condition of the machine used, in that when the air was turned on it caused the machine to start with a jerk and such resulting jerk caused the injuries complained of, and where it was claimed that if the machine had been in good order it would have worked smoothly when the air was turned on and the accident would not have occurred, the question, under such circumstances, as to whether or not the defective condition of the machine was the proximate cause of the injury is one of fact to be determined by the jury.

Stearns Coal & Lumber Co., *vs.* Calhoun (Kentucky), 179 Southwestern, 590, November, 1915.

While the boss driver cannot be presumed to have any right to order his assistant to take part in the work of repairing a wreck of trip cars, this being a distant branch of the mining service and outside of the scope of the boss driver or his assistant, yet a court may presume that the boss driver had authority to suspend his assistant from his regular employment and place him under the orders of a bank boss, a common superior, for any particular service for which he might be needed, and as to which such bank boss might command or except his services, and where such assistant boss driver was killed while aiding in such work outside of the scope of his employment, the operator may be liable for his death, if it is shown that the bank boss ordered such assistant boss driver to perform the service he was rendering at the time he was killed, or if the bank boss implicitly authorized it by knowingly accepting the service, then the operator would be liable for the death of such assistant boss driver.

Republic Iron & Steel Co. *vs.* Quinton (Alabama), 69 Southern, 604, p. 606; July, 1915.

The rule of approximation is now applicable to placer mining locations and entries upon surveyed lands, to be applied on the basis of 10-acre legal subdivisions.

McKitrick Oil Co., in re, Land Decisions, August 13, 1915.

# Current Federal Legislation

Thus far 14,662 bills have been introduced in Congress, 4,092 in the Senate, and 1,570 in the House of Representatives. Of these bills, 1,247 were introduced in the Senate during the month of January and 3,796 in the House of Representatives during the same period.

Of the bills synopsized in our last issue, S 52, providing for a commission to suggest amendments to the mining laws, was passed by the Senate, substituted before the House Committee on Mines and Mining for H. R. 18, and killed in the committee by adverse vote. Fuller report upon this bill will be found elsewhere in this issue.

H. R. 153, creating a Bureau of Labor Safety in the Department of Labor, was passed by the House of Representatives, carrying an amendment as follows:

Provided that nothing in this act shall be held to repeal, modify or affect any other act of Congress in force at the time of the passage of this act.

H. R. 408, providing for the leasing of water power sites on the public demain, was passed by the House of Representatives, and being referred to the Senate Committee on Public Lands, an entirely new bill was substituted and this bill is now upon the Senate calendar for consideration.

H. R. 406, providing for the leasing of lands upon the public domain, containing coal, phosphate, oil, gas and potash, was passed by the House of Representatives and is now being considered by the Public Lands Committee of the Senate. Hearings thereon began February 2.

The following bills of interest to mining men were introduced during the month of January:

SENATE BILLS

S. 2846, by Mr. Sutherland, providing compensation for accidental injury to employes of the United States.

S. 2848, by Mr. Sutherland, providing for acquiring a site and erecting a national memorial to irrigation, at Salt Lake City.

S. 3444, by Mr. Martine, providing for a permanent exhibit of the resources of the States of the Union in or near Washington, D. C.

S. 3761, by Mr. Smoot, granting to the State of Utah the Fort Duchesne reservation for an agricultural college.

S. 3986, by Mr. Warren, granting certain coal lands to the town of Kaycee, Wyoming.

S. 3620, by Mr. Brady, providing for the establishment and maintenance of mining experiment, mine safety and assay stations, for making investigation and preparing and issuing information to those engaged in mining, for keeping records of mining properties, for making assays for prospectors, and for other purposes.

S. 4059, by Mr. Thomas, providing that any suit involving the right or interests of a State or States, not of a political nature, may be brought against the United States, the Supreme Court of the United States being given exclusive jurisdiction.

HOUSE BILLS

H. R. 6887, by Delegate Wickersham. This bill is substantially the same as S. 869, by Senator Pittman, synopsized in the January issue of the Journal.

H. R. 6902, by Mr. Hayden. This bill provides for the reservation of lands within the Colorado River Indian Reservation, bearing coal, oil or other non-metalliferous minerals, and further provides that lands containing metalliferous minerals may be entered under the general mining laws, except that the price therefor shall be ten dollars per acre, and providing that any locations made in good faith upon the lands, in said reservation, prior to July 1, 1914, may pass to patent under the general mining laws, the money paid therefor to be credited to the Indians of said reservation.

H. R. 8807, by Mr. Hayden. This bill provides that all patents on lands hereafter located shall reserve a right of way for utilities constructed by authority of the United States.

On the introduction of the general leasing bill in the Senate, it was referred automatically to the Committee on Mines and Mining. The same bill, in the Sixty-third Congress, was given to the Committee on Public Lands, which held hearings on it, and reported it out favorably. In the Sixty-third Congress the matter of reference proved so vital that it was debated three days in the Senate and then voted on. By a vote of thirty-four to nineteen the measure was sent to the Public Lands Committee.

Senators Shafroth, of Colorado, Walsh, of Montana, and Pittman, of Nevada, figured prominently in the recent discussion. On the roll call the Yeas were forty-six and the Nays twenty-three, so that the bill was changed from the Committee on Mines and Mining to the Committee on Public Lands.

Senator Pittman, of Nevada, a member of this committee, declared: "There is no question that there are going to be hearings on the power bill that will run for weeks, if not for months. The fact that the committee reported it out favorably at the last session does not mean that it is not going to consider it at this session."

## SURVEY IS BORING FOR POTASH NEAR AMARILLO

A depth of 200 feet has been reached in the well which the United States Geological Survey is boring near Amarillo, Tex., in the hope of discovering a deposit of potash. The well will be sunk, if necessary, to a depth of 3,000 feet. The work is in charge of the Survey's own employes, and a chemist is present continually to take advantage of each step of the exploration work.

Owing to the solubility of potash, no deposits are likely to exist close to the surface. The German deposits do not come nearer than 700 feet of the surface, and are known to continue downward below 3,000 feet.

# BOLIVIAN TIN TO BE SMELTED AT BIG PLANT IN THE UNITED STATES

## Department of Commerce Removes All Obstacles to the Development of Great Industry in This Country—Bolivian Government Helps in Perfection of Arrangement Which Will Be of Great Benefit to the U. S.

A tin-refining industry is to be established in the United States. Heretofore all tin has been imported in a finished state to be manufactured in this country. A tin smelter and refining plant is being completed by the American Smelting and Refining Company at Perth Amboy, N. J., for the handling of South American ores, according to an announcement from the Department of Commerce.

All arrangements have been made for the importation of Bolivian tin ore. The venture is the first attempt to establish the tin industry in this country.

First word of the new industry was received in a letter from William Loeb, Jr., of the American Smelting and Refining Company, to Secretary Redfield, in which it was stated that the new plant for the smelting of tin ores and concentrates and the electrolytic refining of tin had practically been completed. There were many difficulties in the way of establishment of the industry in this country, he told the secretary, but these have all been overcome.

Heretofore this country has imported about 45,000 tons of tin annually, and about 90 per cent of this came from the Straits Settlements, where an export duty is placed on ores to compel treatment in the Settlements.

### LITTLE IS MINED

Although the United States is easily the greatest user of tin, only a small quantity is mined in this country, and no smelting has been done here. Large quantities are received indirectly by way of England, Belgium, and Germany, in normal times. Some of this is from the Straits Settlements and some from the Bolivian mines, the concentrate ore being shipped from the latter country to Europe for further refining. In normal times the United States imports about $50,000,000 worth of tin, which is somewhat more than a third of the world's production. Bolivia produces about $25,000,000 worth annually.

The Bolivian tin, according to Mr. Loeb's letter, contains impurities which, with the established methods of smelting, do not produce a tin suitable for tin plate, but the plant at Perth Amboy proposes not only to smelt the impure ores from Bolivia and other countries, but to refine the product by the electrolytic process. A recent analysis of this electrolytic tin by experienced chemists showed it to run 99.98 per cent pure, while the base metal from which it was produced contained only 93 per cent. For the manufacture of tin plate this tin is pronounced as good as the best Straits tin.

"In addition to building the plant and purchasing the South American tin ores," writes Mr. Loeb, "we are financing the miners by making liberal advances immediately on shipments from South America. We hope eventually to be able to extend our present plant and increase the business considerably. In the initial steps of our negotiations to secure these tin ores, we were greatly helped by the cooperation of the chief of your Bureau of Foreign and Domestic Commerce, the commercial attache of the department in South America, and by the State Department."

There were many obstacles in the way of importing tin ore from Bolivia, some of which have been removed through the assistance of the State Department, and some by the assistance of the Department of Commerce. The whole project was formally launched when Mr. Loeb called at the Bureau of Foreign and Domestic Commerce and outlined the importance of establishing a tin-smelting industry in this country and the difficulties in the way of getting tin from Bolivia regularly and in the required amounts. The bureau immediately got in touch with its commercial attache at Lima, Peru, who thereupon went to Bolivia and started negotiations with the Bolivian Government through the United States Minister. Through these negotiations many misconceptions on the part of the miners were removed, and most of the troublesome points that had prevented the drawing up of mutually satisfactory contracts were smoothed out.

### ASSURANCES FROM BOLIVIA

In the meantime the Secretary of Commerce had addressed a letter to the State Department suggesting that the matter of Bolivian export duties be taken up with the Bolivian Government, and that some expression of opinion from that government be obtained as to future interpretation of the old treaty between the two countries. The State Department exchanged notes with Bolivia, and the final result was that the Bolivian minister of foreign affairs signed an assurance that there would be no future discrimination against the United States in the matter of export duties.

The value of a tin-smelting industry to the United States is great, but difficult to estimate in its full importance. The smelting industry itself will give employment to many workers, and will be a great convenience in many ways to the great tin-plate industry. But the purchase of great quantities of ore from a South American country will establish credits in our markets in

their favor and lead to the establishment of commercial relations with that country which would otherwise have been difficult to effect. The Bolivian minister, Senor Don Ignacio Calderon, calls attention to this important point by emphasizing the necessity of buying in foreign countries as well as selling there. The ships that carry ore to the United States will carry back American products for South American markets.

## USES OF RARE METALS OUTLINED BY U. S. GEOLOGICAL SURVEY

Uses of rare metals have been outlined as follows by the U. S. Geological Survey:

*Antimony*—Used in Babbitt and other bearing-metals; type metals; "white metal" alloys used as a foundation for silver plate, coffin trimmings, toys, clock frames, etc.; shrapnel and other bullets and shot. Various salts are used in manufactured rubber, enamels for household utensils and wares, in glass making and in dyeing. Used sparingly in pyrotechnics and medicine.

*Arsenic*—In the elemental form arsenic is used to harden shot and make them take a rounder form. As arsenious oxide, the "white arsenic" or "arsenic" of commerce, it is used extensively in glass; as an insecticide and weed killer. Many other arsenic compounds are also used as insecticides, and others are used to a small extent in dyeing. Small quantities are used in tanning and medicine.

*Bismuth*—The metal is used as a component of cliché or low melting-point metals and in solders. The various salts such as the subnitrate, sub-gallate, salcylate and others are used in medicine.

*Selenium*—Used in making red glass, electrical resistances, and cells for measuring light.

*Tellurium*—Very little use is known for tellurium. A little has been used in coloring glass, and a patent has been taken out for its use in aluminum alloys.

*Cobalt*—Used in coloring glass and ceremic wares blue; in "high-speed" tool steels; in stellite (an alloy of cobalt, chromium and other metals, depending upon the use to which it is to be put); and in insect poisons.

*Molybdenum*—Used in ribbon or wire in electrical resistance furnaces; as supports for tungsten filaments in incandescent electric lamps; in "high-speed" tool steels, and, as ammonium molybdate in the determination of phosphorus, and in other chemical work. It is also used in some forms of stellite, and in the Roentgen ray tubes.

*Nickel*—The great use of nickel is in making nickel steel. A nickel-copper alloy is used as a jacket for bullets; great quantities of nickel are used in plating various metallic objects; and smaller quanties are used in making coins. The American coin known as a "nickel" contains only 25 per cent of nickel; the rest is copper. Various nickel alloys are proposed as substitutes for steel. Monel metal, an alloy of nickel and copper, containing also a small quantity of iron, is made by smelting the Sudbury (Canada) ores, without separation of the metallic contents. Monel metal is used for valves on high-pressure steam engines; as a roofing material, in sulphuric acid pumps; and in other places where a metal highly resistant to ordinary chemical is needed.

*Tantalum*—Tantalum now is little used. For a time it was used in making filaments for incandescent electric lamps. It has also been used in surgical and dental instruments, and for pens.

*Tin*—Tin is used largely as a coating for sheet iron or sheet steel, to make tin plate, ordinarily known as "tin," and of which it forms only 1 to 3 per cent; used extensively in alloys for bearing metals, "white metals," etc.; also in making pipes for organs and in many places where a non-oxidizing metal is required.

*Titanium*—Used in cast iron, steel, and bronzes, largely as a purifier. Titanium potassium oxalate is used as a mordant in dyeing leather and some textiles. Other titanium compounds find a small use. As carbide, ilmenite and oxide it is used in arc lamps.

*Tungsten*—The great use of tungsten is as a component of the highly complex alloy steels known as "high-speed" steel. In these 14 to 20 per cent of tungsten is used. It is also used in some forms of stellite (see Cobalt). Smaller quantities are used in incandescent light filaments, in electric contacts, Roentgen ray tubes, phonograph needles, and as an alloy with iron in castings for automobile engine valves.

*Uranium*—Many experiments have been made with the object of using uranium as an alloy in steel, but they do not seem to have been very successful. Uranium alloys with copper and other metals have been placed on the market to be used in brass and other alloy work, principally as deoxidizers. Uranium salts are used in glass and pottery coloring.

*Vanadium*—The great use of vanadium is as a component of the "high-speed" and other steels. Vanadium is also used as a deoxidizer in steel, bronzes, brasses and bearing metals. Small quantities of vanadium salts are used in various chemical industries.

*Radium*—Radium is almost wholly used as a curative agent in various diseases, such as cancer, lupus, eczema, arthritis, etc. A little radium is used in making luminous clock and watch faces, house numbers, etc.

### Mines Exhibit at Panama

A. A. Krogdahl of the Bureau of Mines, San Francisco, has been furloughed to accept duties with the Panama National Exposition Commission which will have charge of the American exhibit at the Panama Fair, which will open February 21.

The Bureau of Mines sent the principal portion of its San Francisco exhibit to Panama for the fair which will be given under the auspices of that republic.

## BIRDSEYE TELLS OF TRIP IN MT. RAINIER BLIZZARD

Claude H. Birdseye, who has just been made chief of the Rocky Mountain division of the topographic section of the United States Geological Survey, is well known among Western mining men. He led a party up Mount Rainier a few years ago. An adventure resulted, which he narrates as follows:

"Our start was made at 5 o'clock in the morning. Our instruments and light rations gave a pack of twenty pounds per man, and we climbed at a brisk rate, reaching the top of Gibraltar at 7:30 and East Crater at 9:30 o'clock—a climb of over 4,000 feet in four and a half hours. We noticed very little wind until the brim of the crater was reached, but once on top the gale was terrific. We at once threw up a rock wall as a wind shelter for the surveying instruments, but before any observations could be made clouds rolled in from an apparently clear sky, preventing any work for the time being. To remain was undoubtedly dangerous, but we decided to take a chance. The study of mountain conditions during the preceding month had proven that no prophecy could be safely made as to summit weather on Mount Rainier. It would be exceedingly discouraging, we felt, to descend and then find that conditions on top had suddenly changed for the better. Consequently, we remained behind our wind shelter until noon. Then the weather suddenly turned much worse and snow commenced to fall. Hastily swallowing a small portion of our lunch, we started the descent, having cached our instruments in a comparatively dry ice cave. Our trail made on the ascent was found obliterated, but we continued down, relying on the direction of the wind for our bearing and realizing that a return to the crater could be made if necessary. The wind veered, however, and when our barometers showed the general elevation of Gibraltar no familiar landmarks or rocks could be recognized. We found ourselves in a labyrinth of crevasses, and soon had to confess that we were utterly lost. Krogh insisted that we were at the head of Emmon's Glacier, while Harmon and I felt that the crevasses were at the head of Nisqually Glacier. Several attempts were made to locate Gibraltar by traveling laterally along the slope of the mountain at the supposed elevation of this rock, but with no results. By 3 o'clock in the afternoon we decided that further descent was impossible, while to remaih in the open would be fatal. Consequently, a return to the summit was ordered, and a two-hour climb of danger and torture followed. We now found that new snow had filled the crevasses, making the crossings very dangerous. At times we sunk almost out of sight in the soft smother, but managed to wallow through, and following the steepest slope we reached the crater rim at 8 o'clock, all of us in a state of almost utter exhaustion and chilled through and through nearly to the point of freezing. Here on top we found the blizzard even worse than on the slopes. It was impossible to stand erect on the rim, the men being actually blown back into the crater, where, however, it was possible to travel and see a few yards ahead. We were searching frantically for the steam caves. The first cave encountered looked favorable, and we lost no time in entering. The main cavern had several side galleries, in each of which were steam jets, and we selected the largest opening, about 6x8x3 feet, for our abode. Here we partook of our evening meal—one-half of an orange, one-half cake sweet chocolate and one hardtack per man, but, best of all, a pint of hot tea, which one of the men had carried in a thermos bottle.

"While this steam cave was undoubtedly a life-saver, one can look back upon it with no feeling of real joy. Long before the night had passed we were all dripping wet, thoroughly steamed and half frozen by turn. All took part in pounding and rubbing the others and preventing each other from falling into a fatal sleep. In spite of every effort, some one would drop into a doze, only to be yelled

CLAUDE BIRDSEYE

Recently promoted to position of topographic engineer in charge of Rocky Mountain Division, Geological Survey.

at and rudely awakened by the others. All three of us were thoroughly inured to exposure and hardship but this experience was perhaps a record-breaker. As morning broke and the day advanced with no indication of a change in weather, our sufferings visibly increased. With budding hopes, each man would make a trip out on to the rim, only to return with clothes frozen stiff and hopes shattered. It was not until toward noon that the sun appeared at intervals through clefts in the clouds overhead, even then to disappear after shedding a few seconds' warmth. But a rising barometer revived our spirits, and we prepared to attempt a descent at the first indication of a break in the weather. Our clothes had long since been steam soaked, but every man carried an extra pair of heavy woolen socks, which we used as mittens, and, although these were wringing wet, we partially dried them by placing them inside our clothing next to the skin. The same crude process of drying and ironing was followed by each with a large bandana handkerchief, which, bound around the head, would afford some protection to the ears and face.

"At 2 o'clock in the afternoon the clouds broke to the eastward, and Gibraltar became visible just where it should be, but where we had failed to find it. No time was lost. Scrambling over the rim, we started down the mountainside, half running, half sliding, sometimes involuntarily slipping and tumbling head first, our only thought being to get off the summit as quickly as possible. Almost instantly all our clothing, as well as our head and hand coverings, were frozen stiff; but this mattered not. Crevasses filled to the brim with new snow proved no obstacle to our rapid progress, which, in fact, became a rout, and the descent to Gibraltar from the crater, nearly 2,000 feet, was made in twenty minutes.

## TIN PRODUCED IN ALASKA GOES ABROAD FOR REDUCTION

There just has come from the presses of the Geological Survey a new report on tin mining in Alaska. It is by Henry M. Eakin, who is assigned to geologic reconnaissance and investigation of mineral resources in Alaska.

In discussing tin mining in Alaska, Mr. Eakin, among other things, says:

"The first discovery of stream tin in Alaska was made by the Geological Survey in 1900 on Buhner Creek, in the York district, which occupies the western extremity of Seward Peninsula. This discovery awakened interest in the possibility of finding commercial bodies of ti nin this part of Alaska, and in 1901 and 1902 considerable prospecting for stream tin was carried on in this field. The first commercial production of tin ore was made in 1902. From that time until 1911, when the first tin dredge was installed, the placers were worked only on a relatively small scale. Since 1911 the dredge on Buck Creek has operated successfully each season, and in 1914 two dredges were installed on Anikovik River, for the recovery of gold and tin together.

"Lode tin was first discovered at Cape Mountain in July, 1902, by W. C. J. Bartels. The following year Arthur J. Collier and Frank L. Hess, of the Geological Survey, found a tin-bearing lode on Lost River, in the eastern part of the York district. Lode mining has been carried on to a greater or less extent ever since the first discovery. The earliest operations were carried on for several years at the Cape Mountain locality, considerable underground development work being done and a few small shipments made. The ground held by the company was then patented, and the property has since been idle. The Lost River mine had been under development in a small way for several years prior to 1913, when the more extensive operations under the present management were begun.

Stream tin has also been found in different parts of the Yukon basin—on Cleary and other creeks of the Fairbanks district in 1904, in the Circle and Hot Springs districts, probably, in 1908, and in the Ruby district in 1912. There has, however, been no commercial development in any of these fields except in the Hot Springs district.

"Practically all the tin produced in Alaska has been shipped abroad for reduction. The earlier shipments went mainly to Swansea, Wales, but lately a large part of the production has been sent to Singapore.

"The tin deposits of the York region have been investigated by a number of different parties of the Geological Survey. The most exhaustive studies are those contained in the earlier report of A. J. Collier and a later publication by Adolph Knopf.

"The growing importance of the tin-mining industry in Alaska led to a re-examination of part of the York district in 1914, and to a similar investigation of the tin deposits of the Hot Springs district. Only a brief time could be devoted to the work."

Mr. Eakin acknowledges the courteous hospitality shown to him by the residents of the districts visited, and the assistance in collecting data generally lent by the operators. Special acknowledgment is due, he says, to George Jamme, of Lost River and Seattle; Walter Johnson, of San Francisco, and Sylvester Howell, of Tofty.

## BLACK HILLS REGION SUBJECT OF ELABORATE FOLIO

N. H. Darton and Sydney Paige are completing an elaborate folio of the northern Black Hills area, which includes Deadwood and Lead. The latter mining district contains the famous Homestake mine. The geology of this region is highly complicated. The folio is one of the most elaborate yet completed by the Survey.

# Recent Patents of Interest to Mining

Lamp-Holding Attachment for Miners' Caps, No. 1168700. This invention is by Lovell M. Ashley, Jr., of Winona, W. Va., and relates to lamp holding attachments for miners' caps. The holder consists of a bracket, including laterally bent terminal portions adapted to be attached to the top and vizor of the cap, with a band slidably mounted on the intermediate portion of the bracket, with a means for locking the band against sliding movement and lamp holding arms carried by the band.

SINTERING

Method of Agglomerating Ores, No. 1166903, by Philip O. Harding, of Pittsburgh, Pa. This invention relates to the agglomerating of ore, particularly iron ore, a procedure commonly called sintering.

In the ordinary operation of blast furnaces there is a large amount of flue dust, which is rich in iron, but because of its finely divided condition is difficult to handle, and the recovery of its iron content has been found to be so costly that it has only been regarded as waste. The effort to recover the ore from the flue dust led to the sintering process.

It has been found a matter of great difficulty to obtain a uniform agglomeration and produce an article which does not contain pockets of unaltered and friable material.

This invention consists primarily in subjecting a body of material to be agglomerated to a progressive combustion, which advances through the body, causing the current of combustion-sustaining gas to flow to the region of combustion through that portion of the body which has already been subjected to the agglomerating fire, and at the same time effecting a breaking up of that portion of the body through which the combustion-sustaining gas is advancing. Such breaking up opens the pockets of unaltered material, and the current of air sweeps the material so exposed back into the region of combustion, where it will undergo ignition and agglomeration.

The invention also consists of an apparatus for performing the operation above described.

ASSIGNED TO JEFFREY MFG. CO.

Mine Cage No. 1168501, by Paul W. Holstein, of Columbus, Ohio, and assigned to the Jeffrey Manufacturing Company.

This invention relates to mine cages, and has for its special object to provide mechanism whereby a car can be run upon the cage at a landing and held more securely in position than heretofore while the cage is being lifted to the surface of the ground.

The cage comprises essentially two parts, the sling frame and the tilting platform pivotally secured to each other at their lower ends. A canopy is provided to protect workmen in the cage from falling bodies. This canopy is so hinged that it can be swung into a vertical position to permit the lowering down the shaft of rails, etc. This cage is equipped with a latch adapted to catch and hold in fixed position longitudinally an oncoming car, with skids adapted to support the car body, and a means for lowering the car until the car body rests upon the skids.

DESULPHURIZING

Desulphurizing and Smelting Ores. No. 1,169,069, by Arthur S. Dwight, of New York, N. Y. This invention relates to improvements in processes for treating ores, particularly those which are susceptible of desulphurizing. The process consists of sintering and smelting ore initially in a fine condition, by continually forming a thin stream or layer of the ore, sintering the stream into a relatively strong and rigid sinter cake at a point relatively remote from the region of smelting, and continually moving the cake horizontally away from the region of the forward part of the cake into the region of smelting, subjecting it to smelting action. The invention also consists of an apparatus for ore treatment comprising a continually moving element, a means for depositing a continuous stream of ore on the element, with a means for causing the sintering of the ore by the action of heat into a continuous cake, and also a means for continually smelting the forward end of the advancing cake, while the cake retains the heat of sintering.

CONCENTRATING PLANT

Means for Concentrating Ores. No. 1,167,638. By Thomas A. Edison, of Llewellyn Park, West Orange, N. J. The invention relates to improvements in means for concentrating ores, in which the ore constituents to be separated and separately collected are of different densities. The invention provides means for concentrating ores by a plurality of horizontally elongated, substantially level, endless tanks, the tanks being so arranged adjacent to each other that each tank, except one, surrounds an adjacent tank. It provides means for producing a uniform flow of liquid in a horizontal direction in portions of each of the tanks, and

means for introducing ore into the uniformly flowing liquid in each tank, by which the ore constituents are separated and deposited according to their density by the action of gravity and the flowing liquid. It also provides means for collecting and removing ore constituents so deposited.

CONCENTRATION

Apparatus for Separating the Metallic and Rocky Constituents of Ores. No. 1,167,835. By Dudley H. Norris, of San Francisco, Cal. It relates to the concentration of metallic ores. The invention comprises an apparatus for separating the metallic and rocky constituents of ores, comprising means for introducing water containing air in solution into a flowing mixture of crushed ore and water at a number of different points along the path of travel of the mixture, so as to cause nascent bubbles of air to form continuously and rise to the surface, carrying off the metallic particles of ore.

ZINC ORE TREATMENT

Process of Recovering Zinc from its Ores. No. 1,167,701. By Frederick Laist and Frederick F. Frick, of Anaconda, Montana.

This invention relates to the hydrometallurgical treatment of zinc ores, and is specially adapted to the treatment of so-called complex sulphide ores which are not readily amenable to treatment by the usual process. The process consists of leaching the ore with an acid reagent, oxidizing the dissolved ferrous salt, purifying the solution by adding thereto an excess of calcine in presence of an agent capable of oxidizing ferrous iron, and electrolytically regenerating the oxidizing agent with simultaneous deposition of metallic zinc.

REDUCING IRON ORES

Process of Reducing Iron Ores and Other Metallic Oxids to the Metallic. No. 1,167,016. By Emil Bruce Pratt, of Lakewood, Ohio.

Mr. Pratt claims to have found a process of reducing iron ore to metallic states, by heating the ores within a furnace to the necessary temperature in the presence of hydrogen as the reducing agent, excluding all oxidizing gases, and admitting to the furnace only such amounts of carbon as will give the reduced metal the desired amount of carbon, and regulating the temperature of all parts of the charge to cause the desired amount of silica in the ore and in the fluxing material to be reduced and as silicon to combine with the iron. The metal can then be withdrawn from the furnace in the desired condition.

ORE DRYING

Ore Drying Apparatus. No. 1,166,909. By John Q. A. Houghton, of Lowell, Vermont.

This invention relates to ore drying apparatus suitable also for drying other similar materials, in which the ore to be dried is contained in revoluble containers which are subjected to the action of heat. One of its objects is to provide a construction such that products of combustion may be carried from the fire box without contacting with the material being dried. Another object is to provide a feeding means by which the passage of the ore through the feeding chute to the feed box may be controlled, and also to provide means whereby the containers for drying the ore may be revolved.

AMALGAMATION

Combined Concentrating and Amalgamating Machine. No. 1,169,083. By Warren L. McLean, of San Francisco, Cal.

This invention relates to a combined concentrating and amalgamating machine. One of its objects is to produce a concentrator for handling gold-bearing sand, and particularly to separate the coarser gold by concentration and the fine gold by amalgamation. Another object is to produce an apparatus in the nature of a "knock-down" structure that may be readily taken apart for shipment and put together again by a person of ordinary ability, and to produce an apparatus that is simple in construction, efficient and durable in operation, and which is so arranged that the water may be reused, practically speaking, indefinitely.

Several new methods of increasing the supply of American potash have recently been brought to the attention of the Bureau of Foreign and Domestic Commerce, of the Department of Commerce. One of the most promising of these efforts to find a substitute for German fertilizers is a patent taken out a few weeks ago by a Canadian for a method of using the potash in ordinary feldspar.

The process is a simple one, consisting of heating the feldspar with limestone and iron oxide at a temperature of about 2,200° F., which produces a partly fused mass that is easily decomposed by a weak acid. From this product the potash salts can readily be extracted for further purification. The inventor has been in consultation with Dr. Norton, the expert who has been looking after the potash and dyestuff situations for the Bureau of Foreign and Domestic Commerce, and it seems very possible that greatly simplified method of transforming feldspar into fertilizer will soon be available.

**Carborundum Materials**

Carborundum refractory materials are manufactured only by the Carborundum Company, Niagara Falls, N. Y. Statistics can be obtained only from that company.

# STANDARDIZATION OF MINE-ACCIDENT RECORD HAS BEEN BEGUN

## Bureau of Mines Sends Out New Blanks Showing the Nature of the Report That is to be Made at the End of the Present Year—More Detailed Information Requested—Inaccuracies to be Eliminated

What is regarded by authorities as a long step forward in the matter of securing mine accident statistics has been taken by the Bureau of Mines. Information that will go more into detail and that will do away with certain inaccuracies will be called for at the end of the current year.

The Bureau has sent out to all operators of mines, coal and metal, the blanks which are to be used this year. This in itself has called forth much commendation. Too often information is asked at the end of the year which requires a great deal of additional labor to furnish. When the operators are aware at the beginning of the year just what they are going to be called upon to furnish, it is a matter of little inconvenience to arrange their records so that the matter may be kept day by day. At the end of the year it is then just a matter of entering the figures on the blanks the Government furnishes.

The new blanks will make possible the standardization of mine accident records throughout the country.

Fatality rates based on the number of men employed are not as accurate as they should be, because many of the men do not work full time, are not exposed to danger as long as others, and the calculated fatality and injury rates are too low. The rates should be based on the number of full-time men actually exposed to the dangers of the mine, and can be obtained only by recording the actual number of hours worked during the year, as shown on the payroll. The total number of hours for all men divided by 3,000 will give the actual number of 3,000-hour workers exposed to the hazard of the industry during the year. For this reason the form calls for total hours worked by all men during the year.

On the following form, for instance, the twenty-two items numbered are the same as have been requested from coal mine operators previously. Under each of these heads more detailed information is asked. The lettered items are new.

NUMBER KILLED UNDERGROUND

1. Falls of Roof (coal, rock, etc.):
   - (*a*) At working face.
   - (*b*) In room or chamber.
   - (*c*) On road, entry, or gangway.
   - (*d*) On slope.
2. Falls of Face or Pillar Coal:
   - (*a*) At working face.
   - (*b*) On road, entry, or gangway.
3. Mine Cars and Locomotives:
   - (*a*) Switching and spragging.
   - (*b*) Coupling cars.
   - (*c*) Falling from trips.
   - (*d*) Run over by car or motor.
   - (*e*) Caught between car and rib.
   - (*f*) Caught between car and roof while riding.
   - (*g*) Runaway car or trip.
   - (*h*) Miscellaneous.
4. Gas Explosions and Burning Gas:
   - (*a*) Due to open light.
   - (*b*) Due to electric arc.
   - (*c*) Due to blown-out shot.
   - (*d*) Due to explosions of powder.
   - (*e*) Miscellaneous.
5. Coal-Dust Explosions (including gas and dust combined):
   - (*a*) Due to open light.
   - (*b*) Due to electric arc.
   - (*c*) Due to blown-out shot.
   - (*d*) Due to explosions of powder.
   - (*e*) Miscellaneous.
6. Explosives:
   - (*a*) Handling and transportation.
   - (*b*) Caps, detonators, squibs, fuse.
   - (*c*) Thawing.
   - (*d*) Premature blast and short fuse.
   - (*e*) Charging and tamping.
   - (*f*) Blown-out or windy shot.
   - (*g*) Sparks from match, lamp, or candle.
   - (*h*) Returned too soon.
   - (*i*) Delayed blast.
   - (*j*) Shot breaking through rib or pillar.
   - (*k*) Suffocation by powder gas.
   - (*l*) Drilling into unexploded charges.
   - (*m*) Miscellaneous.
7. Suffocation from Mine Gases.
8. Electricity:
   - (*a*) Direct contact with trolley wire.
   - (*b*) Bar or tool striking trolley wire.
   - (*c*) Contact with mining machine.
   - (*d*) Contact with machine feed wire.
   - (*e*) Contact with haulage motor.
   - (*f*) Miscellaneous.
9. Animals.
10. Mining Machines (other than 8c.).
11. Mine Fires (burned, suffocated, etc.).
12. Other causes:
    - (*a*) Fall of person.
    - (*b*) Machinery (other than 10).
    - (*c*) Rush of coal or gob.
    - (*d*) Falling timber.
    - (*e*) Suffocation in chutes.
    - (*f*) Miscellaneous.

NUMBER KILLED IN SHAFT

13. Falling Down Shafts or Slopes.
14. Objects Falling Down Shafts or Slopes.
15. Cages or Skips.
16. Other causes:
    (*a*) Overwinding.
    (*b*) Breaking of cables.
    (*c*) Miscellaneous.

NUMBER KILLED ON SURFACE

17. Mine Cars and Mine Locomotives.
18. Electricity.
19. Machinery.
20. Boiler Explosions or Bursting Steam Pipes.
21. Railway Cars and Locomotives.
22. Other causes:
    (*a*) Explosives.
    (*b*) Fall of person.
    (*c*) Falling objects.
    (*d*) Suffocation in chute, bin, or culm.
    (*e*) Miscellaneous.

## INTERESTING POINTS BROUGHT OUT IN INCIDENTAL GEOLOGICAL FINDS

Radium deposits, the wearing away of the land by the sea, the make-up of the upper part of the earth's crust at various places, the development of mountain ranges, and the origin of dolomitic limestones are some of the subjects discussed in a volume recently published by the Geological Survey entitled "Shorter Contributions to General Geology, 1914." In former years the announcement of incidental discoveries made by geologists in connection with the study of their main problems has awaited the preparation of extended reports on those problems, but by a plan which has recently been put into operation by the United States Geological Survey such minor additions to the world's store of knowledge, even though unrelated, are now grouped together in one volume and published as promptly as possible.

Some of the conclusions in the volume which has just appeared are of interest to the general public; others will be appreciated only by those who have made a special study of geology. For example, the articles on the rock strata known to geologists as the "Montana group" describe the strata which make up that group and their variations from place to place and interpret the facts set forth, giving their significance as to the origin of the strata and the conditions under which they were formed. Most of the field evidence was obtained in examinations of public land for the purpose of determining its value as coal land.

Indirectly a thorough knoweldge of the strata makes the finding of coal and other valuable deposits easier, but the value of the work is not wholly expressible in dollars and cents, for in the realm of pure science the understanding of the make-up of the earth and its history in the past has a value entirely apart from what such knowledge may at present yield directly or indirectly in money.

An article on pitchblende ores of Colorado includes not only an account of those ores in that State, but also a brief description of the principal European occurrences of pitchblende, one of the ores of radium. An article on erosion in Chesapeake Bay prophesies that certain islands in the bay will be washed away by the waves within the next century and shows the places on the bottom of the bay to which the sand and soil of these islands is being carried by the waves and currents. Another article describes some lavas which have been thrust into cracks in the earth's crust in the vicinity of Spanish Peaks, Colo. Still another article shows that echinoderms, a class of sea animals, secrete skeletons of one kind of material in cold water and of another kind in warm water, and that the origin of magnesian or dolomitic limestone, which has long been a mystery, may be partly explained by the nature of these skeletons, myriads of which make up considerable parts of certain rocks. Several papers discuss the strata underlying the surface of the earth in various parts of the country and give data of use to the driller of deep wells.

## CRUDE MOLYBDENITE MAY BE ADMITTED FREE OF DUTY

Molybdenite, freed from gangue, may be admitted to this country free of duty, according to a decision by the United States Court of Customs Appeals. In the case of Hampton, Jr., & Co. *versus* the United States the court repealed the decision in this case of the Board of General Appraisers. The decision of the court is summed up as follows:

1. Molybdenite, Mineral Substance, Crude.—Molybdenite, a mineral substance imported in its natural state as freed from the rock or gangue formation in which it is found by crushing the rock or gangue without crushing or changing the condition or formation of the mineral itself and then placing the whole in water when the mineral rises to the surface, and is skimmed off, is not dutiable under paragraph 81 of the tariff act of 1913 as a mineral substance partially manufactured, but is free of duty under paragraph 549 as a mineral not advanced in value or condition, etc.—Meyers *v.* United States (1 Ct. Cust. Appls., 506) distinguished.

2. Process Not Manufacturing Process.—It has been uniformly held in customs interpretation that the application of processes necessary to produce an article from its native condition and to bring it into a condition that it may be imported, without affecting its *per se* character, is not regarded either as a manufacturing process or as a process advancing it in value or condition.

### Advertising Barred by Government

A regulation prevents the display of advertising matter in any Federal building. This accounts for the fact that many of the high class calendars which are sent out by mining and other companies, are not seen in the Government offices to which they are sent.

# Traffic Developments of the Month

### Reasonable Rates to Be Secured

In the case of G. B. Markle Company *vs.* Lehigh Valley Railroad Company in which complaint was made that rates applying upon anthracite coal in carloads from certain colleries in the Lehigh coal region of Pennsylvania to Perth Amboy f. o. b. vessels for transshipment are unreasonable and unjustly discriminatory; the commission held that:

1. Reasonable rates for the future will be secured complainants by the order entered in *Rates for Transportation of Anthracite Coal*, 35 I. C. C., 220.

2. Following *Plymouth Coal Co. vs. L. V. R. R. Co.*, 36 I. C. C., 140, defendant found to have justified its refusal to continue to furnish storage bins at Perth Amboy, N. J., for the free storage of anthracite coal, and defendant's demurrage regulations governing anthracite coal awaiting transshipment at Perth Amboy found reasonable.

3. Question of reparation held in abeyance for determination in a supplemental report.

### Trim Down Coal Rates

In the case of Chas. W. Davis *vs.* Minneapolis, St. Paul & Sault Ste. Marie Railway Company, the rates charged for the transportation from Manistique, Mich., to Gladstone, Mich., of shipments of hard and soft coal, in carloads, originating in Pennsylvania and West Virginia were found to have been unreasonable to the extent that they exceeded rates of 75 and 50 cents per net ton, respectively. Rates of 75 cents on hard coal and 50 cents on soft coal were prescribed as maxima for the future. Reparation was awarded.

### To Decide Reparation Issue Later

In the case of the Plymouth Coal Company *v.* Pennsylvania Railroad Company and against the Delaware, Lackawanna & Western Railroad Company in which complaint was made that rates applying upon anthracite coal in carloads from Plymouth and Luzerne, Pa., to South Amboy and Hoboken, N. J., f. o. b. vessels for transshipment are unreasonable, the Commission held:

1. Reasonable rates for the future will be secured complainants by the order entered in *Rates for Transportation of Anthracite Coal*, 35 I. C. C., 220.

2. Question of reparation held in abeyance for determination in a supplemental report.

### Withdraw Import Rates

The proposed withdrawal of import rates on ferromanganese from eastern ports to central freight association territory was found to be justified by the Commission.

### Will Order Refund

In the case of the National Petroleum Association *v.* Atchison, Topeka & Santa Fe Railway Company upon complaints that defendants have collected, or seek to collect, charges based on rates higher than their published rates applicable to petroleum tailings in carloads shipped from oil refineries in the State of Kansas, and from an oil refinery at Vinita, in the State of Oklahoma, to East St. Louis, Granite City, and Chicago, Ill., East Chicago and Gary, Ind., and Racine and Milwaukee, Wis., the Commission *Held*, That the published rates on petroleum tailings were lawfully applicable to the shipments involved and that refund of overcharges will be ordered on proper showing. Waiver of certain undercharges outstanding was authorized.

### Fix Coal Rate

In the case of the Pitt Gas Coal Company *vs.* Pennsylvania Railroad Company, the Commission finds the present rate on coal from Besco, Pa., to Ashtabula Harbor, Ohio, and other lake ports in the State of Ohio, when for transshipment by vessels on the great lakes to points beyond, to be unreasonable to the extent that it exceeds 78 cents per net ton. The southern boundary of the Pittsburgh district is changed to include Besco.

### Increase Not Allowed

The proposed increased rates on bituminous lump coal in carloads from mines in Colorado and Wyoming to destinations in Nebraska and Colorado on the lines of the Union Pacific Railroad was not justified.

### Joint Rates Upheld

In the matter of coal to Kentucky points, the proposed cancellation of joint rates from points in West Virginia to points in Kentucky is not justified by the Interstate Commerce Commission.

### Must Continue Through Rates

The proposed cancellation of joint rates which would result in increased rates on coal from Toluca, Ill., to interstate points on the Chicago, Milwaukee & St. Paul Railway were found not justified.

### Reparation Granted

Reparation has been allowed by the Commission in the following cases:

Prime Western Spelter Co. vs. Vandalia Railroad Co., unreasonable charges on thirty-one carloads zinc ore.

## TESTS OF BUREAU OF MINES EXPLODE ESTABLISHED THEORY

A coal dust with a high percentage of moisture is not necessarily inexplodable, though it has been frequently asserted that it is. The tests of the United States Bureau of Mines have shown that a certain coal dust from Utah with nearly 15 per cent of moisture will explode with a rise in pressure far greater than that obtained on exploding some of the coal dusts of West Virginia containing less than 1 per cent of moisture. The water in the Utah coal does not appear to make it safe. That, at least, is the testimony of experiments on a laboratory scale.

In the Utah coal mentioned there is much volatile matter, but in that from West Virginia far less, and the great quantity of bituminous matter in the first coal appears to overcome the immunity from inflammation which might otherwise result from the presence of uncombined moisture.

But all immature coals contain not only much water, but also much volatile matter, so it is not safe to suggest that immature coals are safe; and, on the other hand, there is abundant evidence that while mature coals are not easily inflammable in laboratory experiments and do not generate high pressures, yet in actual tests, when dusts are detonated, the dusts from such mature coal can produce most disastrous effects; for, being able to generate the maximum heat, they assure the greatest possible expansion and the highest pressures.

The safety of Montana coal mines from explosions has been ascribed to the presence of moisture in the coal, and it is true that the water content of the samples of coal that have been investigated is high, while inflammability is abnormally low. But, while the moisture is possibly a cause, it is not the sole reason for the safety of the dust. Apparently its nonfriability is not an important cause either, for even when ground fine for inflammability tests the dust generates little pressure on inflammation by an electric current.

The two Montana dusts tested by the Bureau of Mines were reasonably low in ash, and there is not a hint of the reason why they should be so resistant to inflammation. Until more is known and until the value of the tests of inflammation as a true index of explosability is proved, experts are inclined to admit they do not know why one dust explodes with ease and violence and another dust with difficulty and without energy.

As further evidence of the explosibility of substances containing moisture it may be added that no difficulty has been found in exploding the dusts of grain, by intention or by accident. These dusts all appear to contain from 6 to 10 per cent of moisture, and some also as much as 16 per cent of ash. But these impurities do not prevent such dusts from the sudden propagation of flame.

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## EDITORIALS

### DROP LINCOLN'S POLICY; AN EXPERIMENT BEGUN

Abraham Lincoln laid down the principle of the public-land policy under which the West has been developed, in his memorable statement:

"The public lands are an impermanent national possession held in trust for the maturing States."

The liberal policy founded on that principle continued for a period of forty years without serious question as to its advisability. Occasionally a lone critic voiced the sentiment that all the people should profit by the enhanced value of property brought about by increasing population. Reference was made to the fact that Manhattan Island, purchased in 1631 for $24, had grown to an assessed valuation of more than four billion dollars. The belief was expressed that this immense increase in value should have benefited the whole people rather than those who were fortunate enough to be its owners.

After forty years had passed, this idea, based upon accusations of fraud and dishonesty, commanded so much attention that in the year 1906 an order was issued by the President withdrawing thousands of acres of mineral lands from entry and settlement. This order served to prevent acceptance of filings upon the mineral lands withdrawn, and to make more difficult the securing of patents by those who had applied for them.

A perfectly fair, safe principle is being abandoned and an experiment that threatens the welfare of millions is to be tried in spite of determined protests.

### VALUE OF LIBERAL LAND POLICY PROVEN CLEARLY

Practically four-fifths of the area of the United States was obtained at a cost to the Government of a trifle over $76,000,000. Since that time the Government has received for such of its lands as have been sold the sum of $474,477,393.81. In addition to having received an amount six times greater than the amount paid, large areas have been donated for military service and for educational purposes; more than 80,000,000 acres of land have been donated to railroad corporations to encourage railroad construction, and the Government still retains the ownership of approximately 450,000,000 acres of land. The result by itself seems to be ample justification for the liberal land policies which have controlled during the greater part of the nation's history. The most notable result, however, is the marvelous industrial growth which has obtained as a result of this liberal policy.

### LABOR DEPARTMENT NO PLACE FOR MINES BUREAU

It is difficult to understand the motives of certain labor interests in their continued agitation to have the Bureau of Mines transferred from the Interior Department to the Department of Labor. Several bills have been introduced at this session of Congress looking to this end. One measure goes so far as to provide for the bodily transfer of the Bureau to the Department of Labor. Other bills provide for the change in jurisdic-

tion over certain matters now being handled by the Bureau of Mines.

The Department of Labor does not pretend to be an agent of capital, or of the employer. Louis Post, the assistant secretary of the Department, in explaining to a representative of this publication just what his Department represents, said it is "the State Department of Labor." Just as the State Department of the United States, just as the foreign offices of the European governments, contend for the rights of their nationals, so does the Department of Labor work in the interest of employes. Whether it is right to give one class of the citizenry representation on the cabinet without giving others equal representation is another question and one not pertinent to this editorial. With this understanding of the function of the Department of Labor is it fair to try to put the Bureau of Mines, an activity having as much to do with the employers as with the employes, under its direction?

The Bureau of Mines has nothing to do with the investigation of labor problems. It is a scientific bureau conducting researches into various aspects of mining that are of interest to capital and labor alike. Its work only can be successful with the hearty cooperation of mine owners. Despite the generosity and the broadmindedness of mine operators in general, it is a very natural conclusion that they would lose some of their enthusiasm for this cooperation if the work were turned over to the Department of Labor.

A bill providing for the transfer of the Bureau of Mines to the Department of Labor is not regarded seriously. Such a step would be too radical. There is menace to the mine safety work, however, in the transfer which was proposed. Little additions made quietly here and there to the jurisdiction of the Department of Labor may continue until one of the interests concerned in the industrial upbuilding of the nation may have a considerable proportion of the administrative machinery under its direction. The evils in having any of this machinery in the hands of partisans are many. Some of them we have discussed. We will go into this question deeper at another time. Just at this time, however, the American Mining Congress is particularly interested in calling attention to insiduous activities of some who would ruin the remarkable prospect for good to the mining industry in the activities of the Bureau of Mines under the jurisdiction of the Interior Department.

## THE WATER POWER BILL

The bill for control of water power upon the public domain, H. R. 408, as passed by the House of Representatives, has been amended by the Senate Committee on Public Lands, by the substitution of a bill eliminating very many of the objectionable features in the bill, as passed by the House.

Perhaps the Senate bill, as drawn, is as nearly satisfactory as any bill can be which will serve the purpose of the advocates of this system. During the years of Western development, rights of way over the public domain for public uses have been granted without question. The provision for acquiring such right should be not less onerous than those required to secure rights of way for public uses over privately owned property.

Under the new system, the right to secure government-owned property for public utilities is entirely abrogated, and the government title held to be sacred, as against the right of the public in the creation of public utilities.

The title to privately owned land, whether in the East or West, is always held subject to the broader right of the public, under the eminent domain acts to condemn rights for public uses upon the payment of its reasonable value to be fixed by a jury. It frequently has been held that the title of the government in its public lands is that of a landlord, and not of a sovereign. If this principle is accepted, it would seem that government-owned land can be condemned for public uses under the laws of any State in which the land is situated. The denial of the right to develop such utilities as will serve the public good will likely lead to a bitter contest to determine the question as

to whether the rights of the government are more sacred than the rights of individuals who hold their title by patent from the government.

## WISHES OF WEST ARE THWARTED IN CONGRESS

Revision of the mining laws of the United States was placed considerably further in the future last month by the refusal of the Mines and Mining Committee of the House to report favorably on either of the bills providing for an investigating commission. The wishes of the metal mining States were disregarded.

There are many reasons why one of the chief industries of the nation is treated so inconsiderately. Lack of cooperation among mining men themselves is the chief cause. They had no way of making it absolutely clear that they are a unit on this question. Another important cause is the existence in Congress of the present dangerous committee system. The Mines and Mining Committee members, with one exception, have no first-hand knowledge of metal mining. In the rush of other duties, they have not time to go deeply into intricate technical questions. Their constituents are not interested in laws governing metal mining. Any work their Representative may do on the Mines and Mining Committee will gain him no favor among those who will pass on his re-election. They have interests, however, that must be attended to or a change in Representatives will be likely. The natural course is that such a committee will reach decisions without delving into the matter sufficiently deep to insure correct judgment.

Before a committee of this kind a clever argument like that presented by the Alaskan delegate, is very likely to be successful. The majority of the committee accepted various arguments of Judge Wickersham's which were based on faulty premises. They did not have the knowledge of conditions to discover the errors of the opponent of revision. Just one voting member of the committee lives west of the Mississippi River.

Judge Wickersham's argument undoubtedly was the direct cause of the failure of the committee to report Senator Smoot's bill favorably, his main argument being that the big smelter and copper interests alone want the mining laws revised.

This defeat may rouse Western miners. The metal mining interests have been working too long handicapped by a ball and chain. The mining laws are archaic. They are depressing the industry. They should be revised. There is just one way to secure it. Those interested directly and indirectly in mining must get behind this effort.

## SAFETY-FIRST WEEK SHOULD BE MADE PERMANENT

This month Washington is to be the scene of a great safety-first exposition. The Bureaus of the Federal Government interested directly in the conservation of life and health will have exhibits which will give a graphic impression of the work in which they are engaged. There also will be a convention of State mine inspectors. The exhibits will be on display for a week and the Bureau of Mines is referring to it as "safety-first" week.

We commend this happy thought. We will go one step farther and suggest that safety-first week be made an annual event. We believe that one week a year can be set apart for exhibits of the kind being planned for this year and for the meeting in Washington of State officials having charge of the various activities related to mining and the conservation of life.

There is nothing so instructive as conventions. They are the occasion of systematic discussion of subjects of greatest interest in an industry. Text books naturally cannot be kept current. The latest thought and the most improved practice is brought out by those who address conventions. It is probable, however, that this advantage must be placed second to the profit that comes from the interchange of views by those who attend. Mine inspectors, for instance, from various States get together. Naturally they talk "shop." Each points

out the specific points in his work that he thinks is likely to be most instructive to his colleagues.

The Federal Government is in a position where this safety-first week can be made a great success. The American Mining Congress will lose no opportunity at the meetings that will be held this month and afterwards to urge that safety-first week be made an annual feature of the work being conducted by this Government in the interest of the conservation of human life.

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## TARIFF COMMISSION PLAN WILL APPEAL TO MANY

Senator Owen's plan for a permanent tariff commission, with authority in the President within maximum and minimum limitations to use the flexible rate in the encouragement of foreign trade relations, will commend itself to the former advocates of reciprocity. Senator Owen sums up his reasons as follows:

First. To enable the Executive Department, every Member of the House of Representatives and of the Senate, and to enable the American people to know the truth with regard to the factors entering into the cost of production and distribution of articles entering our foreign commerce and our domestic commerce.

No Member of Congress can perform his ordinary duties and at the same time keep up authoritatively with the 4,000 items on the tariff schedule. It is not humanly possible. Most of the evidence submitted in Congressional committee hearings on the tariff is biased, or partial truth and partial falsehood mixed, and is usually misleading.

Second. This knowledge is necessary to enable Congress, and to enable the Executive Department, to protect American commerce against unfair practices from abroad, such as selling goods below cost for the purpose of breaking down American business enterprises by unfair competitive war, and thereafter obtaining a monopoly of that line.

Third. From the standpoint of those who believe America might be injured by the so-called dumping of foreign goods on this market, such information is essential to safeguard our commerce.

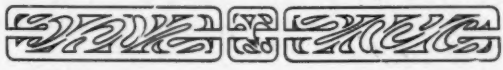
Fourth. From the standpoint of those who believe in reciprocal agreements for the purpose of promoting our foreign commerce, such information is vitally necessary.

Fifth. From the standpoint of those who do not believe in the protective tariff, as understood by the Republicans, but do believe in adjusting a revenue tariff to increase the revenues, and at the same time give a justified incidental protection, such information is necessary.

Finally, as a matter of course, those who believe in a protective tariff would naturally concede that this information is vitally necessary to enable the tariff schedules to be judiciously framed.

Senator Owen's "Justified incidental protection" seems to describe with reasonable accuracy the demand of the advocates of protection. A duty which covers "the difference in cost of production here and abroad as measured by the difference in the cost of the labor involved" would seem to be a "justified incidental protection."

So long as Mexico shall pursue its various revolutions the lead and zinc producers of America can well get along without tariff protection. When Mexico shall again restore order the zinc producer of the Joplin District will not be able to mine 3 per cent zinc ore with $3.50 labor in competition with Mexican 40 per cent ore with $.75 labor. This situation is facing the American zinc and lead producers to whom a "justified incidental protection" will be vehemently welcomed in place of the present tariff duties on these items.



(Continued from page 58)

upon which a new decision must be made. But because there is litigation under these laws is no reason why there should be a revision of the laws. It is a good reason why there should not be a revision. But if it is a reason why there should be a revision, let us start in on the Ten Commandments. God knows there has been more litigation arising over the Ten Commandments or the principles involved therein than all other laws that were ever written by man. We might include them in this revision, because of the extensive litigation which has arisen from their violation.

There is and always was and always will be litigation in respect to all of our property rights. There is no property right either in the East or West which is not frequently involved in litigation, and our courts are full of it all the time. And the more we legislate, the more we turn our revision over to unrestrained commissions who are not responsible to the public for their revision, the more litigation there will be.

Now, let us talk for a few minutes on the subject of the United States mining laws. We have here a bill for the revision of the United States mining laws. What are the United States mining laws? How many of this committee have gone over the United States mineral-land laws and mining laws to discover what we are talking about? Is it a big body of law or a small one? What is it that we are talking about? Here are two volumes, consisting of the Bureau of Mines compilation of the United States mining laws, prepared here in Washington and annotated under the guidance of Judge Thompson in the Bureau of Mines. I have examined these volumes very carefully, and I am very greatly delighted with them. It is a fine work, and I want to call it particularly to the attention of this committee, and then I wish to call the attention of the committee to Judge Thompson's opinion with respect to the bill before this committee.

It is argued here that this is an involved and complex code; that it is something that you gentlemen of this committee can not understand. Why, my friend, Mr. Callbreath, intimated very strongly that this committee could not do anything with these laws; that it was not able to grasp the situation; that it was not capable of judging in matters of this kind, and therefore it would have to abdicate its power and pass it on to this commission provided for in the bill under consideration. Well, now, let us see if that is true. Let us see if we cannot understand these matters, and if, with the assistance of such a man as Judge Thompson, we cannot reach the same conclusions that Senator Thomas reached, that we do not need any commission; that we can do it ourselves, and do it much more to the satisfaction of the country than a commission.

### AS TO THE PERSONNEL

Suppose you pass this bill. Suppose the bill passed tomorrow; who is going to be appointed on this commission? Of course the Representatives who introduced these bills in the House and Senate will say, "We don't know; the President is going to appoint them." But these gentlemen who have been here lobbying for the bill do not think that they are in the dark so much about it. They think they know who is going to be appointed on this commission, and there is no question but what they are very much interested in that feature of the project.

I will give you some information about these gentlemen who seem to be greatly interested in the appointments.

The other day I called the attention of the committee to some of the letters these society officials are writing to us. They are all nice men—they write nice letters; it is a great pleasure to receive them, and I have enjoyed them so much that I have kept them pasted in this little book. They come from Mr. Sharpless, secretary of the Mining and Metallurgical Society of America. Mr. Sharpless's address is 52 Broadway, New York, and, as we look a little closer into their business connections and addresses, you will discover there is quite a colony of them around 52 Broadway, New York, interested in this bill; and I do not want that Broadway bunch to mine the miners in Alaska, even if they do mine the miners in Colorado.

Now, Mr. Sharpless may have been west of the Missouri River, but I doubt it. He is the agent in New York, at 52 Broadway, for a mining company in London, engaged in selling stocks, I imagine from the title—although I do not have any very clear description of the character of their business.

The miners in the West know these mining experts so well that they have a familiar saying out there in criticism of mining witnesses; it is: "Some are liars; some are damn liars; and some are mining experts." Their condemnation continues to get worse as you go along the list. That is what people out there think of them, and I don't want any of them on this commission, and that is where this bill is headed for.

### AS TO MR. WINCHELL

I want now to talk to you for a minute about who they are. Here is the report of the committee on the revision of the mining laws appointed by the Mining and Metallurgical Society of America. It is the basis of this whole scheme of these commission bills, and is signed by H. V. Winchell, chairman; C. W. Goodale, and M. L. Requa. They are the men who were the original discoverers of this idea, so far as the record goes, of having this revision done. Now, who are they? Who is Mr. Winchell? He is a fine man; I am not going to say anything against Mr. Winchell's character, for I have no doubt he is a good man. I have no doubt he is a member of the church and that he attends to his duties of that kind a good deal better than I do, and he certainly stands high in the mining world, because he represents the Amalgamated Copper Co. and has for many years. Horace Vaughn Winchell, mining engineer, Minneapolis, Minn.; first, he is chairman of the committee on mining of the Mining and Metallurgical Society of America, and made these reports which I have been reading from

this document on the subject of this commission bill. Second, he is a member of the American Mining Congress and a member of the committee of that congress on the revision of the mining laws of the United States, which committee is also ably represented here urging this commission bill. Third, he is the geologist—or was for many years—of the Anaconda Copper Mining Co., and is now and has been since 1906 the consulting geologist for the Amalgamated Copper Co. These statements about Mr. Winchell's employment by the Amalgamated Copper Co. are taken from "Who's Who in America," 1914-15, which biographical sketch I assume was prepared by Mr. Winchell himself. I am not saying anything against Mr. Winchell except I do not want him on this commission.

Mr. C. W. Goodale is the second man on this committee of three. He is on the committee on mining laws, appointed by the Mining and Metallurgical Society, and was the manager of the Anaconda Copper Co., etc. For his biography on these matters see "Who's Who in America," 1914-15, page 924; "Who's Who on the Pacific Coast," 1913. Documents of that kind point out fairly whom these gentlemen represent, and are prepared by themselves.

Now, Mr. M. L. Requa is another good man. Mr. Requa developed the Nevada Consolidated Copper Co., and built the Nevada Northern Railway in Nevada, and represented that part of the Guggenheim Copper Trust.

These three are the men who are doing the business, and they represent the Amalgamated Copper Co. and the American Smelting & Refining Co., one or the other—the Copper Trust.

ENLARGE COMMITTEE

Fearing that somebody might raise a question about them all representing one big copper trust, they concluded to enlarge the committee, and on February 19, 1915, after all these reports were made, the committee was increased so as to take off the curse. At the meeting of the council on February 19, 1915, the president was authorized to increase the membership, and the committee on mining law was enlarged by the addition of Messrs. Seeley W. Mudd, Albert Burch, John W. Finch, and Franklin W. Smith.

Seeley W. Mudd is a director in the Ray Consolidated Copper Co., Ray, Ariz., and is a member of the executive committee of the Ray Consolidated Copper Co., Ray, Ariz., and the Ray Consolidated Copper Co. is a subsidiary and connected with the American Smelting & Refining Co.

Mr. W. R. Ingalls also appeared as a voluntary witness. He is president of the Mining and Metallurgical Society. Mr. Ingalls is a nice gentleman. You all saw him, and realized that at once. His address is 505 Pearl Street, New York, and he is editor of *The Mineral Industry*, and president of the Mining and Metallurgical Society of America. But what he knows about mining law or why he ought to be on any commission for the revision of the United States mineral-land laws is something I cannot find out.

Mr. J. Park Channing, who appeared here, has his office at 42 Broadway. Forty-two Broadway—that is the Amalgamated Co.'s office, isn't it? Now, we will just find out. It just struck me that is the Amalgamated Copper Co.'s number. Here it is in Poor's Manual of Industrials, 1915—yes, New York office, 42 Broadway. He is a little close to the Amalgamated—just a little too close to put him on a commission to revise the mineral land laws in Alaska. He is also a director in the General Development Co. and the Miami Copper Co. In other words, he is a copper man, and has his office at the same number on Broadway with the Amalgamated, and being in the copper business and at the same number he ought not to be on this commission, and this committee ought not to fool away very much time listening to him.

I will turn back now just a moment. I have given you what I can find out—just briefly what I have found out about this committee on mining law of the Mining and Metallurgical Society that made these reports we are considering in support of the bill before the committee.

REVISION OF LAWS MEETING

Now, here are some documents they sent to me, and I suppose to all of you, when this meeting of the Mining and Metallurgical Society of America, the American Mining Congress, and the American Institute of Mining Engineers was held in Washington, December 16—last month. I will read a little from this document. Here is what they say about the object of the meeting in Washington on December 16—last month:

> First. To urge upon Congress the necessity of modifying the existing United States land laws as they affect mineral locations.
>
> Second. To urge the appointment of a Government commission whose business it shall be to investigate by every means possible questions and interests involved and make recommendations as a basis for proposed mining law revisions.

Now, that was the object of that meeting. That was the purpose that brought that group of Copper Trust lobbyists to Washington and before this committee. And on this side of this same sheet is the program and list of speakers—look at it a moment.

At the first or morning session the president of the American Mining Congress was in the chair. At the second or afternoon session the president of the American Institute of Mining Engineers was in the chair, and at the evening session the president of the Mining and Metallurgical Society was in the chair, and down below is the list of speakers. I will not read the Members of Congress and Senators on that list of speakers, because I do not think they are in very good company, and I do not want their names in this record.

The first man on the list of speakers is John Hays Hammond. He has for many years been the Guggenheim agent in the examination of their great copper properties, and he is part and parcel of the American Smelting & Refining Co. now, just as much as Daniel of the House of Guggenheim is, and everybody knows it. "Who's

Who in America," 1914-15, page 1017; office, 71 Broadway, New York.

The next is J. Parke Channing, whom you saw on the stand and who hails from 42 Broadway, New York—the Amalgamated Copper Co.'s member.

Next is Mr. Horace V. Winchell, whom you now know as the special representative of the Amalgamated.

The next is Mr. Edmund C. Kirby, mining engineer and metallurgist of 918 Security Building, St. Louis, Mo.

Then comes Sidney J. Jennings. Now, Mr. Sidney J. Jennings is a director in the Tennessee Copper Co., as you will see on page 2567, Poor's Manual of Industrials, 1915. Mr. Jennings is a director in the Tennessee Copper Co.

### AS TO MR. SAUNDERS

Then Mr. W. L. Saunders appears. He is the president of the American Institute of Mining Engineers, and one of the speakers. He is also a director in the International Harvester Co. see Poor's Manual of Industrials, 1915, page 388. Now, why a man who is a director in the International Harvester Trust should be taking such a deep interest in the revision of the United States mineral-land laws in the West, you can guess as well as I can. The fiscal agent of that company is J. P. Morgan & Co., one of the partners in the Alaska Syndicate and Guggenheim Copper Trust.

Now, those are the gentlemen who have appeared before this committee in person or by record, and who are at the bottom of this whole proposition of getting this commission appointed. They all represent in some fair degree either the Amalgamated or the American Smelting & Refining Co. They are so close to that interest that if they do represent anything in the way of mining revision they represent the Copper Trust and little else, and I do not want them on a commission to revise the United States mining-land laws for Alaska, and I do not want their advice on any subject relating thereto. Of course, if any mining bill is pending before this committee if they come in and state honestly what they do represent—that they represent the Amalgamated or the American Smelting & Refining Co.—I would give them a more careful hearing than I would if they came here pretending to represent something else. They have a right to be heard, but they have no right in advance of a public hearing on a pending bill to be suggesting to this committee what this committee shall do, or what laws we shall pass for the revision of the United States mineral-land laws in the West.

### MAKES COMPARISON

Following Judge Wickersham's remarks Mr. Callbreath said:

Had Judge Wickersham been the Delegate from Alaska at the time I referred to in my previous statement there would have been a very different condition prevailing so far as Alaskan coal claims are concerned. And I say now that in my judgment if Congress at that time, undertaking to legislate for the opening of the Alaskan coal fields had appointed a commission at an expense of $25,000 and sent it to Alaska, and they had come back here with a full understanding of the situation and had suggested to Congress laws for the opening of those coal lands, that Alaska today instead of having a white population of 32,000 or 33,000 people would have a population of half a million people; instead of paying to the Federal Government $30,000 a year in revenue taxes, it would be paying to the Federal Government half a million dollars annual revenue taxes. I say that to meet these problems in an intelligent way, based upon the experience of the men who understand the situation, is a good business proposition for the Federal Government. To say now that we may undertake to amend these laws in Washington without investigating the conditions upon the ground, in my judgment is a thing that cannot be effectively done.

Particular stress has been laid upon three particular amendments which have been urged by certain individuals before this committee. Those same individuals are questioned as to their motives, and it seems, so far as the statement to the committee is concerned, that these are the men who began this movement. I want to say that the American Mining Congress—and if you will read the records of the American Mining Congress, particularly the proceedings of the Denver convention and the official calls of our various conventions, you will never think of such a thing as connecting the American Mining Congress with the American Smelting & Refining Co. They had nothing to do with this movement looking to a revision of the land laws, and the work was begun by our organization long before the Mining and Metallurgical Society was created, and we have been pressing along in a steady manner, continually asking for action of this sort. Mr. Kirby, who is at the head of our committee, is the man who devised this plan; the man who has been continually agitating it before the Mining and Metallurgical Society was created and before the gentlemen who appeared before the committee had anything to do with this movement.

### PROSPECTORS CAN'T COME

It is said that you may bring before the committee, when you undertake to revise these laws, the men who will tell you how it should be done. Who will be the men to come before the committee? The gentlemen who have been questioned as being interested in these big mining companies. They are the only people who can come. Do you expect the prospector from Alaska or Colorado to come here? It has been said there are no prospectors in Colorado. That is not strictly true.

This movement did not start in Alaska. It started from people who feel the pinch of the situation and who need a law which would meet the requirements of their work. The points that have been brought before this committee are only as one to fifteen of the things in the mining law that need revision.

I have given the subject a good deal of thought and I would not think of such a thing as under-

taking to frame a law to present to you gentlemen which I believed would meet the situation until I had gone upon the ground and examined the particular situation which is to be met. And I do not believe that you can accomplish it in any other way.

MAKES PLEA FOR MINERS

Now, let us reach this from a practical standpoint. A bill has been passed by the Senate. That is the Senate's view, and we will hardly expect the Senate to reverse its course. If we go along with them, we will accomplish something. If we undertake a new course, there will be a division and nothing will be accomplished; therefore if you want to help the mining industry of the West, give them what they ask for, and do not refuse them that service because at the last minute some other gentlemen who are criticised have come in here and espoused the cause. That is no reason why the practical mining men of the West who have been asking for this for years should be set aside and given a stone.

Congress is not bound by this commission, but you gentlemen who admit that you do not understand those conditions can send out your agents who will come back and tell you just what the conditions are which you are to meet by legislative enactment. It is a simple proposition, and if you pursue that course I believe you will accomplish something. I fear that if you pursue any other course nothing will be done, and I trust this committee will very seriously consider this question.

As to who shall be members of this commission, I have no choice. Make it three lawyers or leave the selection entirely to the President. I am satisfied they will bring facts to your attention which will enable you to get at the real truth of just what should be done. I do not think that it can be accomplished in any other way.

SENATOR SMOOT'S VIEWS

Senator Smoot explained that he worked for ten years to secure amendments to the mining laws. After this long trial to obtain piecemeal revision, he decided, along with the House committee, that a complete revision would be necessary.

Before introducing his bill in this session of Congress, he conferred with the heads of the American Mining Congress and the Mining and Metallurgical Society, Senator Smoot said. They, as well as all others directly interested, approved the bill, and it was introduced and passed by the Senate.

In his testimony Senator Smoot declared emphatically that a subcommittee of Congress could not gather the information necessary for an effective revision of the mining laws.

With regard to Judge Wickersham's fear that the report of a commission will be an entering wedge to the mining of the minerals of the country under lease, Senator Smoot declared that if such a danger existed in the slightest degree, he would oppose a commission vigorously; but there is no ground for any such outcome of a commission's report, he holds. Incidentally, Senator Smoot told of some of the remarkable achievements of the Utah Copper Company.

Both Senator Smoot and Representative Taylor criticised Judge Wickersham for his fight against the appointment of a commission. They called attention to how they have acted on his advice in regard to Alaskan legislation, because they feel that he is in a better position to reflect public sentiment than are they who have not been on the ground. Applying the same reasoning to the mining States of the West they did not disguise the fact that they consider Judge Wickersham unduly officious in his efforts against the commission proposal.

Mr. Taylor said to Judge Wickersham at the hearing: "Nobody but you is opposed to this measure. There isn't anyone from the seventeen western mining States who does not want this bill to pass."

Senator Smoot declared that there are not ten men in the States affected who are not anxious that the commission investigate before any attempt was made to revise the mining laws.

During the session of the committee Representative London, the only Socialist member of Congress, lost no opportunity to request that a representative of organized labor be on the commission. His activities finally called forth this from Representative Dennison: "I think, Mr. London, you are laboring under a misapprehension. This is not legislation to codify laws affecting the relations of employer and employe. If it were we would consider your suggestion." Mr. London insisted, however, that in revising the laws that it should go into the matter of safety devices and other matters affecting the men.

"The mining interests of the West feel as if they have been treated as a kind of stepchild," said Representative Taylor. "They feel that Congress has given them no attention for forty years. If we would send a commission out and meet these people and talk to them, it would let that country feel as if they had had a hearing. It would show them that their wishes are being considered, and when the commission came back and reported the sentiment of these mining States and mining camps it would certainly tend to crystallize public sentiment, and it would add to the weight of their report. The people out there would feel as though they were being consulted."

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## DIRECTOR MANNING URGES REVISION OF MINING CODE

The Director of the Bureau of Mines, Van H. Manning, had some interesting things to say before the House Committee on Mines and Mining last month. Some extracts from his remarks follow:

The Bureau of Mines is criticized for being largely responsible for a good many of the conservation bills introduced in Congress, but

it has been my idea, and it was also the idea of my predecessor, Dr. Holmes, to convince the mining industry that the Bureau of Mines is not a bureaucratic organization. We want to cooperate with the operators and mining engineers in a way which will secure the best results for the work of all of us.

Agitation for revision of the mining land laws of the United States has been going on in the mining industry for a good many years. During the Roosevelt administration a commission was appointed by the President of the United States to report upon this subject. The report of the majority of that commission, which consisted of distinguished mining engineers and lawyers, is understood to be to the effect that the mining laws should be revised. However, the report of this commission was never published.

Since then, however, action has been taken by the several associations of mining engineers and mine operators of the United States, in most cases after prolonged consideration and debate. The Mining and Metallurgical Society of America, the American Institute of Mining Engineers, and the American Mining Congress—the three national organizations—have expressed themselves to the effect that the mining laws of the United States ought to be revised and coordinated in whole, and that a commission shall be appointed to recommend to Congress a new and workable code. Similar action has been taken by the several State mining societies of the country. On December 16, 1915, representatives of these organizations, and of American mine operators generally, to the number of 125, met in Washington and expressed themselves to the same effect. The mining press of the country, moreover, is in favor of this movement. In fact, there is a singular unanimity of opinion in the mining industry that the laws under which mining lands in the public-land States have been located and developed during the last forty-five years are in many respects unsatisfactory and pernicious.

Both the present Secretary of the Interior, Mr. Lane, and his predecessor, Mr. Fisher, called attention to the utter inadequacy of various features of the existing mining laws and to the need of revision.

The extralateral rights feature of the law of 1872 came to be regarded as so impracticable and so provocative of litigation that in every great mining district of the United States it has been nullified by common consent, or else by one great company buying out all conflicting interests. At Eureka, Nev.; at Leadville, Colo.; at Bisbee, Clifton-Morenci, and at Miami, Ariz., the apex law of 1872 has been discarded by common consent, each mining company operating within those districts confining itself to the ground comprised within its surface lines extended down vertically. At Butte, Mont., an extraordinarily costly litigation was terminated by the Anaconda Copper Mining Co. buying out the concerns with which it was in conflict and acquiring practically a monopoly of the mountain containing the great veins of Butte. The less important mining districts of the Rocky Mountain region have experienced a similar history.

It can be said fairly that the extralateral right provision has contributed far more to litigation than to economical mining.

At the present time there is no expert in the exploitation of mines and no expert in the practice of mining law who is capable of writing a new law which would adequately meet all of the conditions that have developed in the modern science of ore deposits and mining. Before a satisfactory law can be written it is necessary that there be an exhaustive study of the whole question. Why do not the mining societies themselves undertake this and tell Congress specifically what they want? They say that they do not do so for the reason that they consider the investigation that is necessary to be so onerous a task, involving the expenditure of all the time of a committee for so long a period, that it is beyond their means. Moreover, they are of the opinion that such a committee should visit all of the important mining regions of the United States in order to hear directly just what mining men in all parts of the country think is needed in the way of revision and change. Such a committee should have an official standing which will enable it to secure all available information.

Since the present law went into effect, ore deposits have come to be worked that were not then worked at all, owing to their low grade. Indeed a large part of the copper produced in the United States today is coming from ore deposits that could not be worked profitably so recently as ten years ago. These ore deposits are incapable of location according to the terms of the law of 1872. The mining industry wants a new law that will legalize the location of new ore deposits that may hereafter be discovered and that will give a security to mining titles.

It may be observed that some of the specific matters touched upon could be cured by amendments to the present law. My answer to this is that the law should be revised as a whole. There should be a harmonious relationship between all the provisions of the statute. This cannot be done unless the law is thoroughly revised and rewritten. Piecemeal attempts to right manifest injustices will not result in the permanent improvement of conditions which is the thought and desire of those urging creation of the commission.

I want to indorse Senator Walsh's statement in regard to the necessity of this, as viewed from the standpoint of a technical bureau. We think it will be in the interest of the efficiency of the operation of the Bureau of Mines that there be a revision and codification, and we urge that that be done as soon as it is possible to do so.

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## REVISION OF LAWS FIGHT IS NOT TO BE GIVEN UP

Plans for continuing the work looking to intelligent revision of the mining laws were discussed at a lunch given by F. F. Sharpless, of the Mining and Metallurgical Society of America, at the Lawyers' Club, New York City, January 19. Those present were: J. Parke Channing, J. R. Finlay, E. B. Kirby,

George C. Stone, James F. Callbreath, A. S. Dwight, W. R. Ingalls, F. F. Sharpless and Louis D. Huntoon.

Mr. Callbreath told those present of the hopeless legislative status of Senator Smoot's bill, providing for the revision of mining laws. Following Mr. Callbreath's remarks, an informal talk was held, during which plans were discussed for following up the matter in a way that would secure a satisfactory outcome.

## CHANNING HAS EQUIPPED THREE LARGE COPPER MINES

J. Parke Channing, the well known mining engineer, at the request of the House Committee on Mines and Mining made the following statement with regard to his experience and connections:

"I am a consulting mining engineer, graduate of the Columbia School of Mines, and have followed my profession for thirty-two years. For the last fifteen years I have been in the financial, as well as the administrative, side of mining. I have developed and equipped three very large copper mines, and at the present time I am a large stockholder of and am vice-president of the Miami Copper Co. and also of the General Development Co., whose business is to investigate mining properties in their initial stage and carry them on to the producing stage. I am president of the Naumkeag Copper Co., of the Lake Superior district, which is conducting explorations."

At one point in his testimony Mr. Channing said:

"The present law discourages the prospector from going out and doing work. That is retarding the mining industry and eventually it is going to react against the interests of the whole country. The prospector goes out and he sees a nice piece of ground. To go back a little, the obvious and easily found mineral deposits in the United States were taken up years ago. The prospector now has to go out and hunt things that don't stick their heads up above the ground. There may be a little crack in the ground 2 or 3 inches wide, and he may have an idea that down below it is going to widen out. Now he goes and makes a location on it, and after he has started perhaps some other man comes along and says, 'Oh, there isn't any mineral discovery there. I am going to locate that.' So he may go 15 or 20 feet away and make another location and overlap the first man's claim. Then another man comes along and finds another likely looking crack 50 feet away, and he makes another location. Thus two or three or four locations may be made there, all overlapping, and the first man that comes there hasn't got the chance to develop that he ought to have. There are a great many men that used to do prospecting, but they have given it up and gone out of the business. The law ought to be such that when a prospector goes out and locates a piece of ground that is unoccupied he can put his claim on it and can hold it beyond the shadow of a doubt."

## BIG ROAD RUNS TEST WITH CAR-HEATING HOSE

Desperate conditions developed not long ago through car-heating steam hose failures on one of the biggest roads in the country. Every official, from president down, was fighting delays due to bursting hose. The overhead run-up for several successive months was enormous. It was decided that hose tests alone would determine the cure for unusually heavy pressure trains and extremes in temperature.

With twenty-two trains running daily, the road installed 500 pieces of Goodrich car-heating steam hose, and reported no failures for January, the worst month in the year. February showed two failures, March none and April none. The test was made on condition that Goodrich, the manufacturer of the hose, be allowed to specify strength and quality in proportion to the heavier pressures, the greater number of cars and the additional amount of steam required to heat them.

The result proves conclusively that railroads can safely depend on large and reputable manufacturers for specifications of this kind. As a result of the test, Goodrich car-heating steam hose was adopted as standard, regardless of cost, and it has been found to save as high as 80 per cent of the usual replacements and tie-ups. There may be cases where it pays to buy for a first-cost consideration, but this particular test with car-heating steam hose proves conclusively that first cost is a minor factor, and that authorities on hose quality, like the B. F. Goodrich Company, at Akron, Ohio, can specify the really practical hose for long life and economy.

## IMPORTANT TUNGSTEN AND ANTIMONY DEPOSITS FOUND

Advices to Delegate Wickersham tell of the discovery of an important tungsten deposit near Fairbanks. The vein is said to be four feet wide. The metal is of sufficient high grade that it is being sent out by mail.

Very high-grade antimony also has been found recently in the immediate vicinity of Fairbanks, Judge Wickersham states.

### Addresses Vermont Society

Frederick J. Bailey, chief clerk of the Bureau of Mines, gave an illustrated lecture recently at a meeting of the Vermont Society of Washington at the Washington Club, on "Mine Rescue Work."

# PRICES OF ANTIMONY REACH HIGHEST LEVEL IN HISTORY OF THIS MUCH-NEEDED METAL

## Forty Cents a Pound Being Paid for American, Japanese and Chinese Product—Cookson's Unavailable at Fifty Cents—Wild Rose Spring Mines in California Largest Producers in United States

Antimony prices in 1915 were probably the highest known since the metal became a regular article of commerce. The high prices led to the largest production the United States has made and probably the same statement is true for the world's production.

According to preliminary figures collected for the United States Geological Survey by Frank L. Hess the production of antimony ores in the United States is estimated to have been about 5,000 tons containing 2,000 tons of antimony, valued at about $325,000. The largest previous domestic production was in 1892 when 150 tons of metal were produced in San Francisco from Nevada ores and 380 tons of ore carrying 55 per cent of antimony were exported. Practically all operations of the past year were new, most were small, and they were widely scattered so that it is difficult to obtain close figures immediately after the close of the year.

Antimony which in July, 1914, had been down to a monthly average price of 7.11 cents for Cookson's, and from 5.44 upwards for other brands, rose gradually, though unsteadily, to the end of 1915 when Chinese, Japanese and American antimony were quoted at about 40 cents a pound.

Quotations for Cookson's antimony ceased in May, 1915, some time after an embargo had been declared against the shipment of antimony metal or ores from the British possessions, and 50 cents a pound is said to have been paid for it about June 1, when Chinese was selling for about 35 cents or less. In the fall American antimony appeared on the market for the first time in many years. At first it sold slightly below Chinese and Japanese, but was soon quoted at the same price. Miners and smelters, apparently thinking that the high prices would be temporary, did not begin production as quickly as they otherwise might have done, but before the close of the year properties in Alaska, California, Idaho, Nevada, Oregon, Utah and Washington were producing.

Prices for ores ranged from $1.00 to $2.10 per unit of antimony. At first, only ores carrying 50 per cent or more antimony were in demand, but before the close of the year 20 per cent ores were being shipped from Nevada.

From Alaska, according to data collected by Alfred H. Brooks, about 685 tons of stibnite ore carrying 58 per cent antimony was produced in the Fairbanks district from properties on Eva, Vault, Treasure and Chatham creeks. It is reported that 132 tons were shipped from Nome, but it seems probable that more was mined.

The largest production was made from deposits near Wild Rose Spring, on the northwest slope of Telescope Peak in the Panamint Range, California. These deposits have been known for many years but have been too far from railroads for profitable exploitation until the past year when prices were high and a branch railroad was built to Trona on Borax Lake, within about 25 miles of them. The deposits contained considerable antimony ocher as well as stibnite and were mined by the Merchants Finance Co. (Western Metals Co.). The same company operated deposits 30 miles northeast of Mojave, which are 10 miles from the S. P. R. R. at Neuralia, in Kern County. Other deposits were mined in California at many points in Kern County, in the eastern end of San Benito County, and on Moore's Flat near Grass Valley. In Nevada considerable quantities were mined at many points mostly in the northwest quarter of the State with Lovelock as a center, but ranging from Pass Canyon in the Pine Forest Range southward to the vicinity of Tonopah and eastward to Joy.

Oregon, Washington and Idaho produced small tonnages of ore and in Arkansas a company was organized to work old properties west of Gilham.

The Chapman Smelting Co. of San Francisco which had been idle for a number of years again started the smelting of antimony ores. The company mined ore at Bernice, 60 miles east of Fallon, Nevada, and brought ores from other points in the Western States, Alaska and British Columbia.

The Merchants Finance Co. built an antimony smelter at Industrial Harbor, Los Angeles. Besides operating California mines the company operated mines in Nevada and bought ores from the Western States, Alaska, and foreign countries.

The Antimony Smelting and Refining Company of Seattle started a plant at Van Asselt the last of the year and made oxide, but metal is to be smelted also.

The International Smelting Co. bought ores to be smelted at its South Chicago plant. The Great Western Smelting and Refining Co., of Chicago, and the Pennsylvania Smelting Co., of Pittsburgh, have also smelted some ores. The Magnolia Metals Co. found so much difficulty in obtaining needed supplies of antimony at a reasonable price that it bought and mined ores in Nevada, smelting them at Brooklyn.

Harshaw, Fuller and Goodwin Co., of Cleveland, were in the market for pure ores from

which to make antimony salts, heretofore made from Chinese "crude antimony."

The tendency has been for some companies to go to an expense for mine development, machinery and mills not wholly warranted by the circumstances. The present high prices are necessarily temporary. The Chinese deposits are extensive, and worked by very cheap labor, and other deposits are being developed in other parts of the world, and as soon as the war is over, and possibly before, prices will probably drop to a level with or close to those of 1914.

## TELLS OF HUGE REPTILES WHICH ONCE INFESTED NORTH AMERICA

### Geological Survey Report Delves Interestingly Into Features of Past Ages on This Continent

The United States Geological Survey has just published a report which, though technical, nevertheless embodies some interesting history of the early ages of the North American continent. It tells of the rise and fall of a portion of the continent millions of years ago, long before the age of man, at a time when strange beasts inhabited the country, when the climate was subtropical, and when a peculiar swamp vegetation flourished, the remains of which were converted into the present great coal beds of the West.

Late in what is termed by geologists "Carboniferous time," according to W. T. Lee, the author of the report (Professional Paper 95-C), there were mountains in Colorado and New Mexico comparable to the present Rocky Mountains. During the Triassic period and much of the Jurassic, which followed, a time to be measured in millions of years, these mountains were eroded away. Late in the Jurassic period a wide area had been worn down so near sea level that a slight subsidence of the land allowed sea water to enter from the Pacific Ocean and spread over Wyoming, northern Colorado and eastern Utah. Near the close of the Jurassic a slight uplift expelled this sea. After some time this area began again to settle and the streams spread fine sediments over the bed of the shallow basin lately occupied by the sea and over the low-lying lands. This subsidence introduced the Cretaceous period and culminated in the occupation of the region by a sea which reached from Utah to the Mississippi Valley and from the Gulf of Mexico to the Arctic Ocean.

The subsidence was slow at first and the streams spread their muds uniformly over an area extending from New Mexico to Montana and from Utah to Kansas. Only small areas of the Rocky Mountain region were not covered by them. In the streams, swamps and bayous of this early Cretaceous time lived huge reptiles; some of them were 85 feet long and 20 feet tall, with a bulk many times as great as the largest elephant of today. By the close of the Lower Cretaceous time the water from the Gulf of Mexico had spread over the graded plain as far as the present Rocky Mountains. This invasion of the sea was followed, apparently without great lapse of time, by a still greater invasion in the Upper Cretaceous epoch.

The first deposits of Upper Cretaceous age —the Dakota sandstone—were spread out uniformly over the level plain, which then included the whole area that was later pushed up to form the Rocky Mountains. Over these sands which were laid down along the advancing front of the sea, were deposited the marine sediments as the sea moved forward. In its waters lived great numbers of serpent-like swimming reptiles; and over it soared pterodactyls, the fossil remains of which show that they measured 18 feet from tip to tip of wings. On the shores and in its waters sported large diving birds, which still retained the teeth inherited from their reptillian ancestors.

On the shores of this sea, especially along its western margin, great swamps developed and in them grew a variety of semitropical plants, such as palm and fig trees. The resulting carbonaceous material which accumulated as peat was later converted into coal. The sea did not attain its maximum size at once. Probably at no one time was the whole interior basin under water. The advance of the sea and the filling of the basin kept pace with each other, so that sediments and fossils which indicate nearness to shore and coal beds which indicate swamps above sea level are found at many positions from bottom to top of the Upper Cretaceous formations.

At the close of the Cretaceous period notable changes were produced in the geography of the region. The interior basin, which had been subsiding throughout the Cretaceous period, was now lifted; its waters were poured back into the oceans, and the mountains whose roots had been buried were resusticated. In some places the erosion that followed removed from these newly lifted mountains the Cretaceous rocks that once covered them and cut deep enough into the underlying formations to obtain the pebbles of older rocks, which may now be found in the lower part of the oldest Tertiary beds. In other places the Cretaceous rocks were not entirely removed. Beds that once lay 5,000 feet below the level of the sea were lifted to form mountain tops that now stand more than 13,000 feet above sea level.

### Working on Anthracite Map

N. H. Darton, of the U. S. Geological Survey, is working on a map showing the configuration of the northern anthracite coalfield of Pennsylvania.

# VALUE OF SPELTER MINED IN U. S. DURING 1915 INCREASES 300 PER CENT

## Year Just Passed, Greatest in History of Zinc Mining and Smelting in This Country—Prospects for 1916 are Even Better—Smelter Capacity Increased Decidedly During Last Half of Year

Both the zinc smelting and the zinc mining industries of the United States enjoyed a year of unparalleled prosperity in 1915. According to the best information obtainable at this time the recoverable zinc content of zinc ores mined in the United States in 1915 was over 560,000 short tons compared with 407,000 tons in 1914 and 418,000 tons in 1913. With a continuance of high prices for spelter during 1916 the output will be greatly augmented, for the very high prices did not begin until April and May and it was naturally some time before much additional zinc mining could get under way. The production during the last quarter of the year was at a much higher rate than during the first quarter.

For the same reason the output of spelter during 1916 should be much greater than it was in 1915, provided the spelter market remains the same. The output during the first half of 1915 was at the rate of 433,000 tons a year; during the last half it was at the rate of about 550,000 tons. Though the total spelter produced in the United States in 1915 increased 40 per cent over the preceding year, the value of the output increased nearly 300 per cent. However, even this does not represent the true value for it is based on the average price of prime western spelter, whereas there was a large production of brass special, intermediate, and high-grade spelter, all of which command premiums. The real value of the spelter output was therefore probably between 10 and 25 per cent more than the value as given.

### LARGER SMELTING CAPACITY.

There was a large increase in smelting capacity during the last half of the year, the total number of retorts at the end of the year being 154,898, as compared with 130,642 at the mid-year, and with 113,914 at the beginning. In addition 20,758 retorts were under construction or planned. New plants, the construction of which started since the Geological Survey's mid-year report, are those of the American Steel & Wire Co., at Donora, Pa.; the Kusa Spelter Co., the La Harpe Spelter Co., and the Oklahoma Spelter Co., all at Kusa, Okla.; the Henryetta Spelter Co., at Henryetta, Okla.; the American Spelter Co., at Pittsburg, Kans.; and the Owen Zinc Co., at Caney, Kans. In addition to these a four-block smelter with 2,560 retorts is planned in Oklahoma, the exact site not yet having been selected. This does not include the 10-ton electrolytic zinc plant at Anaconda, Mont., or the 100-ton electrolytic plant under construction at Great Falls, Mont., and others contemplated, or the electrothermic zinc smelter planned at Keokuk, Iowa.

It seems certain that the zinc-reduction capacity of the United States will soon be equal to every conceivable call upon it. The all-absorbing question is as to what demands will be made upon it in 1916. Brass cartridge cases, large or small, may be used as many as 35 or 40 times. Doubtless it will be possible to save and reload many of the empty cases used in the war and in times this should tend to lessen the demand for spelter. On the other hand, the recent lengthening of the battle lines in Europe should increase the demand for the metal. Furthermore, the growing demands for home consumption must become a greater factor in 1916. These demands will have to do not only with current operations but with restoring reserves and stocks that have been allowed to become depleted during several lean years. For this reason an average prosperous year should show a home consumption of zinc above the average.

The following figures have been compiled without change by C. E. Siebenthal of the Geological Survey, from reports furnished by all operating smelters of zinc ores except one, showing their output for the first 11 months of the year and their estimated production for December. The output of one smelter, treating both ore and drosses, has been estimated. Figures showing the imports and exports for 10 months were obtained from the Bureau of Foreign and Domestic Commerce and to these figures estimates for November and December have been added.

### A RECORD PRODUCTION.

The production of primary spelter from domestic ore in 1915 is estimated at 460,000 short tons, and from foreign ore at 30,000 tons, a total of 490,000 tons, worth, at the average St. Louis price, $139,160,000, compared to a total of 353,049 tons in 1914, worth $36,010,998, and made up 343,418 tons of domestic origin and 9,631 tons of foreign origin. This was a gain of 137,000 tons and of more than $103,000,000 in value. As noted above, however, the gain in value was considerably more than this amount. The production of spelter from both domestic and foreign ores, apportioned according to the

States in which it was smelted, by six-months periods, was as follows:

*Spelter production, 1914–15, by States, in short tons.*

| State. | 1914 First half. | 1914 Second half. | 1915 First half. | 1915 Second half. |
|---|---|---|---|---|
| Illinois | 62,062 | 65,884 | 74,982 | 85,348 |
| Kansas | 23,737 | 20,773 | 35,247 | 65,398 |
| Oklahoma | 45,443 | 45,924 | 51,172 | 57,532 |
| Other States | 43,816 | 45,410 | 55,131 | 65,190 |
| Total | 175,058 | 177,991 | 216,532 | 273,468 |
| Yearly total | 353,049 | | 490,000 | |

While the output of each State was more in the second half of the year than in the first Kansas showed the greatest gain, nearly doubling the production of the first half and getting back to old-time figures.

The number of retorts at the beginning of 1915 was 113,914, at the midyear it was 130,642 and at the end, 154,897. All available retorts were in active operation and new retorts were put into commission as fast as completed. The large amount of the higher grades of spelter made by redistillation from the ordinary grades necessitated a greatly enlarged retort capacity; so that the actual output of spelter in itself gives no reliable clue to the number of retorts in use. It is not feasible at this time to give the production of redistilled spelter.

The capacity of the zinc smelters by States, together with the additions now planned for 1915, exclusive of the proposed plant on an unselected site in Oklahoma with site undecided, is as follows:

*Zinc smelting capacity, 1915.*

| State. | Total retorts end of 1915. | Retorts to be added in 1916. |
|---|---|---|
| Illinois | 38,424 | 4,840 |
| Kansas | 40,366 | ..... |
| Oklahoma | 39,212 | 7,710 |
| Other States | 36,896 | 8,208 |
| Total | 154,898 | 20,758 |

LARGEST INCREASES IN EXPORTS.

Exports of spelter and sheets made from domestic ore are estimated at 115,000 short tons worth $25,530,000, compared with 64,807 tons in 1914. Exports of spelter made from foreign ore are estimated at 13,000 tons, valued at $2,250,000, compared with 5,580 tons in 1914. The exports of brass are estimated at 33,500 tons, valued at $12,200,000, compared with 3,558 tons in 1914. Manufactures of brass were exported to the value of about $30,000,000, as compared with $3,756,888 in 1914. During the first nine months of the year there were also exported under drawback articles manufactured from 255 tons of foreign zinc, on which duty had been paid, compared with 4,981 tons in 1914.

The exports of domestic zinc ore were about 900 short tons, valued at $45,000, compared with 11,110 tons in 1914. Foreign zinc ore containing 609 tons of zinc and valued at $24,270 was reexported. The imports of spelter (probably mostly scrap) are estimated at 863 short tons, valued at about $122,358, compared with 880 tons in 1914.

The imports of zinc ore in 1915 were approximately 135,000 short tons, containing about 48,000 tons of zinc, and worth about $4,000,000, compared with 31,962 tons of ore, containing 12,132 tons of zinc, in 1914. The zinc imports for the first 10 months of 1915 were as follows:

*Imports of zinc ore, January–October, 1915, in short tons.*

| Country. | Ore. | Zinc content. | Value. |
|---|---|---|---|
| Australia | 45,972 | 16,700 | $1,273,431 |
| Canada | 8,907 | 3,494 | 148,636 |
| China and Japan | 7,572 | 3,213 | 193,604 |
| Italy | 5,312 | 2,125 | 153,388 |
| Mexico | 49,694 | 14,521 | 1,610,270 |

DOMESTIC CONSUMPTION INCREASED.

The apparent domestic consumption of spelter in 1915 may be computed as follows: The sum of the stock on hand at smelters at the beginning of the year, 20,095 tons, plus the imports, 863 tons, and the production, 490,000 tons, gives the total available supply—511,000 tons. From this are to be subtracted the exports of domestic spelter, 115,000 tons, the exports of foreign spelter, 13,000 tons, the exports under drawback, 255 tons, and the stock on hand at smelters at the end of the year (to be exact, on December 15), 20,758 tons, or a total of 149,000 tons, leaving a balance of 362,000 tons as the apparent domestic consumption. This calculation takes no account of the stocks of spelter held by dealers or consumers. On comparing the consumption in 1915 with the 299,130 tons consumed in 1914, the 295,370 tons in 1913, and the 340,341 tons in 1912, it appears that the indicated consumption is not large when the larger exports of brass and manufactures of brass are considered. The stocks are between three and four times as great as at the midyear, but these are probably to be explained as accumulations of the common grade of smelter, the demand being for the higher grades. Reviving domestic consumption will apparently take care in the future of such surplus output of prime western spelter.

HIGHER PRICES.

Spelter opened at St. Louis in January at 5.5 cents a pound and immediately began the long rise, which except for one considerable setback in March and a smaller one in May continued until June 4, when spelter reached 26.5 cents a pound. A sharp drop immediately carried the price down to 17.75 cents by June 22, after which it recovered to 22.75 cents by July 9. Another sharp break let the price go down to 10.75 cents in the middle of August. Several ups and downs

followed, after which the price rose to 19 cents in the latter part of November. A sharp decline carried the price down to 15 cents at the middle of December. A rapid recovery followed, and spelter closed the year at about 17.25 cents a pound. The average price for the year of prime western spelter at St. Louis was 14.2 cents a pound.

The London spelter market opened at £28 2s. 6d. a long ton (6.1 cents a pound) and, nearly paralleling the American market, rose to £110 a long ton (23.8 cents a pound) in the middle of June, dropped to £55 a long ton (11.9 cents a pound) in August, rose to £105 a long ton (22.7 cents a pound) in November, and closed the year at £90 a long ton (19.5 cents a pound). In the first nine months of the year the London price was sometimes below and sometimes above the American price, but from October onward the London price was consistently the higher, in November and December averaging nearly 2 cents a pound more than the St. Louis price.

The price of the "brass special" grade of spelter at Waterbury, Conn., usually averages about 0.4 cent above the St. Louis price. During 1915, however, the differential ranged from 2.5 to nearly 5 cents, averaging about 3.3 cents. The price of the highest grades of spelter is not quoted, but sales are reported at more than 40 cents a pound when spelter was at the high point.

The price of sheet zinc generally ranges from 2 to 2.5 cents above the St. Louis price of spelter. During 1915 sheet zinc has varied from 2.5 to 8.75 cents above the price of spelter.

Zinc dust, heretofore mostly imported from Europe, generally ranges from 1 to 2 cents a pound higher than spelter. In March, 1915, the price of zinc dust began to go up, and in the first two weeks of June it more. than doubled, jumping from 17 cents to 40 cents. There was a decline of a few cents, but by the last week in July the price had settled back to 38 to 40 cents per pound, at which it has since remained.

## FAILURE OF INDUSTRIAL RELATIONS BODY LAMENTED

### Great Opportunity Offered for Good—Walsh so Violently Biased as to Spoil Results

The United States Commission on Industrial Relations cost some $500,000. Its members, representing, or appointed to represent the general public, the employed and employers, made three main reports and three supplemental suggestions embodying opinions or theories, and containing, the mathematicians estimate, 200,000 words, says the New York Tribune editorially. The public must sympathize with the purpose, or what should be the purpose, of such a board, the dispassionate collection of facts in regard to the conditions of industrial employment, the relations between workingmen, organized and unorganized, and employers; the merits and the defects of labor organizations and employers' associations, strikes, boycotts, hours, wages, output, prices as affected by labor unions, a great nexus of economic interdependencies. There is a general public, as well as a particular private, interest in these matters. The prosperity and even the social peace of the State is largely bound up in the status of these and similar questions. Moreover, the temper of the age is humanitarian. Indeed, no inconsiderable part of the community, in its generous desire to help what it conceives to be the weaker side, is sometimes inclined to forget that tyranny, duplicity and injustice are human, not a monopoly of employers.

What the commission should have yielded was a calm view and review of the actualities of the labor situation, with reference to the correction of inequalities and injustices, not necessarily wholly by legislation, but by public opinion, making its own judgment on accepted facts. Unfortunately, the chairman of the commission, one of the three members appointed to represent the public, has displayed from the first a heat and violence of bias and a passion of intemperant speech that have disgusted some of his colleagues, destroyed confidence and deadened interest in the commission, made it mainly a fantastic futility.

Two reports discredit the work of Mr. Walsh's "investigators." The report signed by him and the three representatives of labor purposes, according to the published summary, a new inheritance tax so graded that while making generous provision for the support of dependents and the education of minor children, it shall leave no large accumulation of wealth to pass into hands which had no share in its production. The money snatched from the unproductive rich is to be used to extend education, to develop "other important social services" yet to be disclosed, and in association with States and municipalities, on "great constructive work, such as road building, irrigation, and reforestation."

It is superfluous to characterize this frank project of confiscation. Will the English language be enriched with a verb "to walsh"? What is the use of considering seriously a report which demands a Constitutional amendment already incorporated as the Bill of Rights in the Constitution, and proposes

That Congress immediately enact by statute or, if deemed necessary, initiate a Constitutional amendment specifically prohibiting the courts from declaring legislative acts unconstitutional.

"Swollen, unearned fortunes," "an innumerable number of parasites of every type," "the growth of a hereditary aristocracy"—it is the old jargon. Apparently, Mr. Walsh's "Director of Research and Investigation" supposed that the commission was appointed to redistribute wealth in excess of a million dollars.

The report signed by Professor Commons and Mrs. Harriman, and, with certain exceptions, by the commissioners representing employers, contains, we regret to notice, another extraordinary project. A permanent Commission on Industrial Relations—the one just

dead having been so singularly successful—is to be established. It is to consist of three persons, appointed by the President and confirmed by the Senate. It is to be aided by an unpaid advisory council, comprising ten representatives of associations of farmers and employers, ten of labor associations, and the Secretary of Commerce and the Secretary of Labor. It may conduct investigations, more felicitously, let us hope, than its namesake, but its main business is to administer the labor laws. Another addition to bureaucracy.

To support the Industrial Commission and "further social welfare, without increasing taxation of the people," the Federal Fund for Social Welfare is to be raised by means of an inheritance tax rising from 1 per cent. on estates of more than $25,000 left to direct heirs to 15 per cent on estates of more than $1,000,000.

By increasing the rate as proposed it is estimated that a fund of $200,000,000 a year would be collected, of which $50,000,000 would be returned to the various States.

The principal of this fund it is proposed to invest in homes for workingmen, hospitals, rural credits for farmers, and such other purposes of a social nature as would insure an income.

The income from the fund, which would be administered by the Industrial Commission, would be used to meet the expenses of the commission; to promote the social well-being in the shape of establishing sickness and unemployment insurance, old age pensions, the establishment of employment offices, the promotion of industrial education through subsidies paid to the various States, and enabling tenant farmers to acquire possession of their farms.

Here again let the scheme speak for itself. We only permit ourselves to wonder how its proposers imagine that this enormous sum is to be produced by a taxation from whose incidence "the people" are absolutely secure. This report recommends, on the distinctly humorous ground that immigration is an important question between labor and capital, the administration of the immigration laws by the Industrial Commission. The commission would be in the hands of "labor," which is distinctly hostile to immigration. In case of a scarcity of labor, what chance would the employer have?

The three employer commissioners dissent from the approval given by Dr. Commons and Mrs. Harriman to the secondary boycott. "A rank injustice," they call it. Such it seems to many or most of us. These three commissioners give the impression of fairness and moderation. What they have to say about sympathetic strikes, union politics, union failure to keep agreements, restriction of output, the closed shop, union violence, apprenticeship rules, is well worth reading by everybody; and with much of it many unionists, individually at least, can agree. It is to be regretted that the labor representatives are not always as measured. One of them, indeed, Mr. A. B. Garretson, seems to be suffering from tumidity of the vocabulary. The question may suggest itself to the reader of the first two reports if there is anything like the amount of "unrest" and disbelief in the equality of justice which they assume.

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EDITOR'S NOTE.—The above comment on the Industrial Relations Commission by the New York *Tribune*, made several months ago, is of particular interest, in the light of the continued activities of the unofficial committee, under the direction of Mr. Walsh, which has permanent offices in Washington.

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## UNITED STATES WILL BE READY AT CLOSE OF WAR

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### National City Bank's Publication Says Manufacturers and Labor Leaders Are Working Together—Danger of War Orders.

The effect of changed trade conditions due to war orders on the general industrial life of the country, and the possible consequences of the resultant displacement upon America's capacity for international trade competition after the war, is discussed in *The Americas*, published by the National City Bank. While the changes resulting from the war business have been serious, the article asserts that widespread inquiry shows that the leaders of industry are alive to the danger that will follow when war orders cease.

"There is so much evidence of more than casual interchange of opinion and community of policy and action in the attempt to solve the problem," continues the article, "that it can almost be said that there is a concerted movement in formation to get the situation in hand. This warrants confidence that when the time comes that we must meet close competition again in the world's markets, including our home markets, the national industries will be in strong formation."

Among the difficulties specified as a result of war orders, the first is the rise in the cost of raw materials. Metals have increased from 20 to 40 per cent; wool is much higher, cotton is rising, and food, though not as high as at first, is still far enough up to give ground for the popular conception that the cost of living is still high. "These increases in the cost of materials," it is said, "have caused an appreciable rise in the cost of manufacture in lines not directly catering to war demand. The higher costs have appreciable effect on our manufacturers' campaign for the expansion of export business."

#### RISE IN THE COST OF LABOR

"What is generally taken as a much more serious matter is the rise in the cost of labor.

Preliminary examination of reports from the Eastern States indicates that munition plants are paying their labor about 35 per cent more, in wages and bonus, than the normal wages heretofore prevailing. Over the broad range of general industry not catering to war requirements, there has been only a little rise in wages here and there; but to keep shop organizations intact, some manufacturers have found it necessary to hold their men by meeting, to a certain extent, the higher offers of money made to workmen by the munitions makers.

"The emergency work for the best skilled workmen has been more than men could be found for. An official report of one of the manufacturers' associations states that some munitions makers who have tried to run their machinery day and night with three eight-hour shifts of men have had no success with the plan because the night shifts could not be filled up to a workable quota.

"The demand for labor at high prices in war manufactures has also raised the labor costs of many other factories. Even such men and women as could not work on munitions have become restive in their own places because of the prosperity of acquaintances who are busy on war orders. With the seasonal increase in mercantile and industrial activity there may be a more general tendency to increases in labor costs, and one of the country's shrewdest manufacturing executives says that if wages go up it will be next to impossible to get them down again at the end of the war.

"Another serious phase of the situation arises out of the disorganization of industrial forces through the shifting of large numbers of men out of factories where years of team work have made them efficient parts of the factory organization, to which many will never return. Moreover, too many concerns have been so absorbed in war orders that they neglect old customers and thus lose business that they will need before long.

### WORKING HAND IN HAND

"Now, this situation is being faced in a remarkably constructive spirit by many strong men acting in unanimity. Several manufacturers' associations are maintaining a general discussion of the best policies to pursue. There is no friction between the manufacturers, and as regards the wage problem a very wise attitude has generally been assumed by employers, so that national labor leaders are able to join with them in the most important matters of policy.

"The policy is to concede to labor an increase over ordinary wages in case of the manufacture of war materials, but to put this increase in the form of bonus and special payment, and in every way to get on a basis of friendly understanding between employer and employe that the extraordinary profits of war orders are to be shared, without any alteration of the basic standard of wages. Nearly everywhere the pay of the workmen is given to them in two forms, the regular weekly envelope on the established wage basis, and bonus payments, deferred and made to the workmen at longer intervals, frequently in the form of checks and in varying amounts. A systematic attempt is made to get the workmen to set aside the special payments as savings.

"National labor leaders have shown a serious appreciation of the community of interest between employers and employes in this situation. They appear to be ready to cooperate in furthering a friendly understanding about wages and in preparing for the readjustment that must come later.

"The United States manufacturer is not going to be permitted to forget that national industry cannot get away from economical standards of production without running serious chances."

### WHEN EUROPE COMES BACK

A high authority is quoted as saying: "Industry in this country is going to be ready for sharp competition at the end of the war. It seemed certain when the war began that it would end with Europe badly crippled and unable to offer competition for years. Europe has surprised us already. It now looks as if the nations might come back very quickly and with great strength. But I am confident that United States industry will be ready for the competition. The situation is being handled with rare intelligence, and manufacturers are awaking to the needs of the hour. The connections we are now making in foreign markets will be of great help because some of them are sure to persist."

"The profits of our war orders," the article concludes, "are being widely distributed, and, if rightly used, can help strengthen national industry for the world-wide commercial struggle that is coming. Not, however, if the benefits be perverted into rampant general extravagance or speculation, and we forget the grave danger of a lapse from standards of economy and efficiency. If manufacturing costs and prices rise we will offend the temporary foreign buyers of whom we might make permanent customers and will find ourselves in a costly state of unpreparedness when Europe comes back."

Mining Congress members are requested to advise the Washington office of any change of address. Copies of the MINING CONGRESS JOURNAL are being returned for want of a proper address. This applies to some of the first-class mail addressed to members.

# UNITED STATES MINES MORE THAN 600,000 TONS OF LEAD DURING 1915

## Gain of Fifteen Per Cent Made Over the Output of the Year Preceding—Year saw Opening of Construction Work on Smelter at Coeur d'Alene—Mexico Continues to Import Some Lead.

The lead industry in 1915 made good gains in output, both in mining and smelting. The lead content of ore mined in the United States was apparently over 600,000 short tons, compared with 522,864 tons in 1914, an increase of 78,000 tons, or 15 per cent. With the higher prices prevailing the percentage of increase in value of the 1915 output was even greater as compared with other years.

During 1915 construction was begun on one lead smelter and plans were completed for another, both to treat ore from the Coeur d'Alene district of Idaho. The Hercules Mining Co. purchased the copper smelter at Northport, Wash., and began the construction of two lead furnaces. This company is affiliated with the Pennsylvania Smelting Co. of Pittsburgh, Pa. The Bunker Hill & Sullivan Co. of the Coeur d'Alene district also completed plans for a smelter, but the site is yet in abeyance. The National refinery of the American Smelting & Refining Co., at Chicago, was dismantled, and the Balbach Smelting & Refining Co. abandoned its older lead plant at Newark, N. J.

The following estimates have been compiled by C. E. Siebenthal from reports to the United States Geological Survey by all the lead refineries and soft-lead smelters in operation during the year, except two smelters in the Joplin district, for which estimates have been made. These reports cover actual production for the first ten or eleven months of the year, with an estimate for the remainder of the year, and from them the figures of production are made up without change. The statistics of imports, exports, and lead remaining in warehouse have been taken from the records of the Bureau of Foreign and Domestic Commerce for ten months, the figures for November and December having been estimated.

### LARGEST PRODUCTION TO DATE

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1915 was approximately 565,000 short tons, worth at the average New York price $53,110,000, compared with 542,122 tons, worth $42,285,500, in 1914, and with 462,460 tons in 1913. The figures for 1915 do not include an estimated output of 20,550 tons of antimonial lead, worth $1,886,000, against 16,667 tons in 1914 and 16,665 tons in 1913. Of the total production, desilverized lead of domestic origin, exclusive of desilverized soft lead, is estimated at 306,682 tons, against 311,069 tons in 1914 and 250,578 tons in 1913; and desilverized lead of foreign origin at 48,318 tons, compared with 29,328 tons in 1914 and 50,582 tons in 1913. The production of soft lead, mainly from Mississippi Valley ores, is estimated at 210,000 tons, compared with 201,725 tons in 1914 and 161,300 tons in 1913. The total production of lead, desilverized and soft, from domestic ores, was thus about 516,682 tons, compared with 512,794 tons in 1914.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the reason that the smelters and refiners of argentiferous lead undoubtedly treated more or less soft lead from the Mississippi Valley which is not distinguished from silver-lead ores in their preliminary estimates.

### IMPORTS AND EXPORTS

The imports of lead are estimated at 9,625 short tons of lead in ore, valued at $653,000; 50,825 tons of lead in base bullion, valued at $3,496,000; and 400 tons of refined and old lead, valued at $28,000—a total of 60,850 tons, valued at $4,177,000, compared with 28,338 tons in 1914. Of the imports in 1915 about 58,000 tons came from Mexico, against 23,141 tons in 1914. These imports from Mexico are to be compared with an average of over 100,000 tons before the civil strife in that country. The remaining imports of lead came mostly from Chile.

The exports of lead of foreign origin smelted or refined in the United States again show an increase, being estimated at 43,000 tons, against 31,051 tons in 1914 and 54,301 tons in 1913. For the last two years, on the other hand, notable quantities of domestic lead have been exported to Europe, and the total for 1915 is estimated at 76,000 short tons, valued at $6,650,000, compared to 58,722 tons, valued at $4,501,674, in 1914.

### LEAD AVAILABLE FOR CONSUMPTION

The amount of lead available for consumption during 1915 may be estimated by adding to the stock of foreign lead (domestic stocks are not known) in bonded warehouses at the beginning of the year (7,668 short tons) the imports (about 60,850 tons), the additions by liquidation (1,795 tons), and the domestic production (516,682 tons), making an apparent supply of 587,000 tons. From this are to be subtracted the exports of foreign lead (about 43,000 tons), the exports of domestic lead (76,000 tons), and the stock in bonded warehouses at the close of the year (assumed to be the same as at the close of

October, 16,000 tons), leaving as available for consumption 452,000 tons compared with 449,052 tons in 1914.

HIGH PRICES

Lead began the year at New York with a price of 3.8 cents a pound, nearly the minimum price of the year, and remained practically stationary until the middle of February. A gradual rise brought the price to 4.2 cents in April, and it remained there until the latter part of May. A rapid rise next followed, and lead reached the maximum for the year at 7.56 cents on June 14. A sharp decline, followed by partial recovery and then by a more general decline, brought the price to 4.4 cents in the latter part of August. After a slight recovery and another decline to 4.45 cents in September, the price gradually rose and closed the year at about 5.4 cents. The average New York price for the year was 4.7 cents a pound, compared with 3.9 cents in 1914 and 4.4 cents in 1913.

The London price of lead started at £19 a long ton (4.1 cents a pound) and rose until the latter part of March, when it reached £23 2s. 6d. a long ton (5 cents a pound). From this point the price fell to £20 1s. 3d. a long ton (4.3 cents a pound), after which there was a sharp ascent to £28 2s. 6d. (6.1 cents a pound) at the middle of June. After several ups and downs the price dropped to £20 6s. 3d. (4.4 cents a pound) by the middle of August, and then a gradual rise carried it to £29 5s. a long ton (6.3 cents a pound), and it closed the year at about that figure. The London market was fairly parallel to the New York market and, except for the period of high prices in the United States during July and August, was uniformly higher than the American market.

## MILLING OPERATIONS IN JUNEAU EMPLOY 1,000 STAMPS

Development in the Juneau gold belt during 1914 is the subject of a report just issued by the United States Geological Survey. Henry M. Eakin, the author, says:

"The developments near Juneau, because of their magnitude, overshadow the operations in other parts of the gold belt, yet some of these, too, are of importance. The active small-scale mining and milling operations that were conducted a few years ago in the Eagle River and Berners Bay districts have recently experienced a decided falling off, due in part to a failure of some of the properties to meet expectations and in part to consolidations preliminary to operations on a larger scale.

"Gold lode mining in this field, already developed on a scale that ranks the Juneau district with the foremost in the industry, is rapidly assuming still greater proportions. The growth is a natural response to a fuller knowledge of the size and character of the ore bodies and the economic possibilities of large-scale operations.

"Climatic conditions are favorable to continuous operation. The large size of some of the ore bodies, the physical character of the ores, and a strong topographic relief favor the production of large quantities of ore with a minimum of labor and power. Water power, marine transportation, and a local supply of timber and lumber reduce general expenses to a low point. The extraordinary low costs of operation make available low-grade ores that under conditions only slightly different would be valueless.

"The chief productive mining activity in the Juneau district in 1914 was at the four mines of the Treadwell group, on Douglas Island, where lode mining has been done since 1882 and large-scale operations have been in progress since 1887. The most important development work in progress in 1914 was that of the Alaska-Gastineau, Alaska-Juneau, and Alaska-Ebner mining companies, operating the mines of Silver Bow Basin and Gold Creek, on the mainland a few miles east of Juneau. Prospecting work on a smaller scale was being done at the Salmon Creek mine, near the mouth of Salmon Creek, and at the Alaska Treasure mine, on Douglas Island, about 4 miles southwest of the Treadwell.

"The milling operations in the vicinity of Juneau in 1914 were equivalent to the constant operation of about 1,000 stamps. Mining and milling operations combined gave employment to an aggregate of about 2,250 men.

"The Treadwell group of mines consists of the Treadwell, Seven Hundred Foot, Mexican, and Ready Bullion mines, on the east side of Douglas Island near the shore of Gastineau Channel, along the strike of a single lead. In the first three mines the lode has been developed continuously for about 3,500 feet. Between the Mexican and Ready Bullion mines is an undeveloped interval of about 2,500 feet.

"The ore deposits consist of mineralized dikes of albite diorite intrusive in black slates and belonging to a series of intrusive bodies that appear at intervals along a zone approximately 3,000 feet wide and 3 miles long. The mineralized dikes are cut by reticulating veinlets of quartz and calcite. Both dikes and veinlets may carry metallic sulphides and gold.

"During 1914 all the stamps of the Treadwell group were in practically continuous operation. During this period 1,602,156 tons of ore was crushed, yielding a total output of gold valued at $3,743,944.

"Of the total yield, $2,004,527 was recovered as free gold, and $1,739,417 was recovered from the sulphide contentrates. The average yield per ton of ore milled was $2.34 and the average operating costs were $1.20, giving a net revenue of $1.14 a ton.

"A total of 22,814 feet of development work was done in the four mines, 10,036 feet in ore and 12,778 feet in waste. This work was directed chiefly toward the development of the ore bodies on the lower levels, especially the 2,100-foot level in the Treadwell, the 1,460-foot level in the Mexican, and the 1,570 to 2,200 foot levels in the Ready Bullion and Seven Hundred Foot mines."

# COMPLEX NATURE OF SMELTER RATES NOT OFTEN DUE TO ULTERIOR MOTIVES

## New Processes, Varying Types of Ores and Increasing Detail Responsible for Complicated Schedules—Penalty for Silica Sometimes Is Too High

A long-felt want has been filled, it is believed, by the publication of Technical Paper No. 83 by the Bureau of Mines. It deals with the buying and selling of ores and metallurgical products. Extracts from this paper follow:

It is evident from the foregoing that smelting rates and schedules are of a complex nature, although the principles on which they are based are reasonably simple. It is frequently stated that these rates and charges are made willfully complex by the buyer, in order to obscure the amount of the deductions made. This view may perhaps have been correct in some instances, but the main reason for the complexity of present rates and schedules, is to be found in the fact that the details have been increased from time to time as the smelting industry grew, new processes were invented, and new sypes of ores were found. It certainly seems desirable that the rates and schedules should be simplified in order that they may be more comprehensible to shippers of ores, particularly the small shipper who often is not familiar with the intricacies of the business and hence is not in a position to know whether justice is done him.

There is little question but that the principles upon which the rates and schedules are founded are just enough. However, individual deductions and charges for smelting might not be so reasonable. At first sight it would seem that when lead is worth 4.7 cents per pound, a deduction of over 60 per cent of this value to cover smelting, refining, and freight is too much. Determination can not be made superficially, but there is no question but that, per ton of metal recovered, the smelting of low-grade lead or copper ore is much more costly than that of high-grade ore.

Another point of contention relates to the deduction for silica and the bonus for iron when ore is purchased on the neutral schedule. Frequently the penalty for excess silica is 12 cents and the bonus for iron is 10 cents. It is claimed that the penalty and the bonus should equal each other. This claim is perhaps reasonable in copper smelting, in which the unit of silica is about equivalent to a unit of iron, but in lead smelting two units of iron plus lime are needed to be equivalent to one unit of silica, so that it seems fair to make the penalty on silica higher than the bonus for iron. However, in many contracts at the present time the bonus and penalty figures are equal. It is customary for a shipper who controls a considerable ore supply to enter into contract with the smelting company for the treatment of his ores. In instances of this kind, which are frequent, much better rates and schedules are often obtained than are specified in the so-called open schedules, which are published for the shipper of small isolated lots. Rates also vary, the variation being dependent on the demand for certain kinds of ore. Thus, at times the siliceous or "dry" ores are scarce and again ferruginous ores are scare, so that rates vary with the supply.

### AN IMPORTANT BUSINESS

"The buying and selling of ores and metallurgical products is a great and highly important business in the United States, and one that concerns not only the miner and the metallurgist but the industrial world in general. In this paper the attempt is made to outline clearly its underlying principles, the subject matter being based on personal experience and investigation. The author has endeavored to present the material impartially, and for that reason many of the statements and figures regarding metallurgical practice should be taken as illustrative rather than as applying exactly to average operating conditions. Moreover, the statements as to metal prices and trade methods are to be considered as applying to normal business, not to special conditions that have developed as a result of the war in Europe. As regards the style, technical words and phrases have been avoided as much as possible in order to make the paper easily understood by anyone who might be interested.

"In estimating the value of an ore or any intermediate metallurgical product (other than a refined metal) the basis used is the price of the refined metal at some principal market center, such as New York, at the time the valuation is made. The average price of all copper for 1913 was 15.5 cents per pound, and for electrolytic copper 15.269 cents per pound. The prices for other metals for the year 1914 were as follows: Lead, 3.862 cents per pound; spelter, 5.213 cents per pound; silver, 54.811 cents per troy ounce. Gold has the standard value, established by law, of $20.67 per troy ounce.

"If the metal contents, in pounds for the base metals and in troy ounces for the precious metals, per avoirdupois ton be multiplied by the prevailing price of the refined metals,

the sum of the products will be the gross value of the ore.

"There is, however, a wide difference between the gross and the net value of a tone of ore. From the gross value must be deducted, first, the total cost of mining the ore, and then the total cost or charge for treatment, which includes some or all of the following items: Freight to treatment plant, milling or smelting charge, charge to compensate for losses of metal in treatment, charge for penalties imposed on undesirable constituents in the ore, charge for freight to refining center, charge for refining the metal, charge to cover the selling costs of the refined metal. Which of these charges are imposed and what the amount of each charge is depend on the ore, the method of treatment, and the number of firms that handle the ore and metals in the process from ore to refined metal.

"The types of companies that handle ores and metallurgical products may be classified as follows:

"1. Mining and smelting companies or mining and milling companies, which control all the operations from the mining of the ore to the production and selling of the finished metal.

"2. Mining companies, which mine and sell ore on certain schedules to smelting or milling companies.

"3. Custom smelters or mills which purchase ores and also (a) operate refineries and produce refined metals or (b) sell intermediate metallurgical products to refineries.

"Concerns of type 3 may control mines that furnish a part of their ore supply.

"4. Refining companies, which purchase metallurgical products such as matte, and crude metals, and some ores, and produce refined metals.

"5. Selling agencies, which place the refined metals on the market.

"It is apparent that an ore or the products derived from it may go through many hands before the finished metal reaches the market, and that metallurgical business may be complex. In the following pages the essentials of the commercial side of metallurgical work are discussed in some detail.

### COMPOSITION OF ORES

"It is most important to know the contents of an ore in gold, silver, copper, lead, and zinc, if any or all of these metals be present. In smelting work such other constituents are determined as may be necessary to make proper smelting mixtures. Analyses of ores are made to determine silica, iron, alumina, lime, and, less often, magnesia, barium, sulphur, and arsenic. Many other substances may be determined as occasion demands.

"In gold and silver milling work it is usually unnecessary to make analyses of the ores except to determine gold and silver, although sometimes it is desirable to know the other constituents of the ores, particularly as regards the presence of elements or compounds such as copper, lead, zinc, tellurium, selenium, sulphur, arsenic and antimony, that interfere with the extraction of the precious metals. In lead and copper smelting, however, it is essential, in order to control smelting operations, to know within narrow limits the proportions in the ores and flux of silica, lime, magnesia, alumina, sulphur, and iron, aside from the metallic contents for which the operations are conducted. These facts make a chemical or assay laboratory an essential part of a smelter or mill. This laboratory must furnish the requisite data promptly on short notice in order that the technical operations of the plan may be properly guided. Such laboratories daily turn out a great many routine analyses with accuracy and dispatch.

### SAMPLING, BUYING AND SELLING

"In order that assays and analyses may be of value, the samples assayed must truly represent the lots of ore, the value and composition of which it is desired to know. For this reason it is necessary to sample given lots of ore as they come to the mill or smelter. If ores or metallurgical products, such as matte, pig or blister copper, or lead bullion are sold by one company and purchased by another, accurate sampling is essential. Consequently reliable methods of sampling such products have been devised. If a company both mines and treats its ores, careful sampling may not be necessary, but in most instances will be desirable, in order to verify the technical work and aid in the accounting. In order to facilitate the selling and buying of ore, public sampling and ore-purchasing companies have been established. Such a company acts as a disinterested party between buyer and seller, sampling the ore for a fixed charge per ton.

### PRACTICE AT CRIPPLE CREEK

"As an example of how transactions in ore are conducted, the practice at Cripple Creek, Colo., may be cited. The shipper who sends his ore under contract to a milling company has the right to sample his ore in any of the public sampling works at his own expense. He may then either sell the ore to the sampler, who buys it under the milling company's contract rates, or he may reconsign it to the milling company direct, where it is again sampled, the results of this sampling becoming the basis of settlement for the ore. In any event all ore passing through the sampling works on contract must go to the mill holding the contract. Ore that is reconsigned and not purchased by the sampling company is sampled for 60 cents a ton, but if it be purchased by the sampling company the charge is $1 a ton. As to ore not under contract, the owner has the choice of either selling it to the public sampling works or shipping it directly to the mills or smelter.

"The deductions for treatment made by a sampling company are governed in every instance by those quoted by mills and smelters, as the sampling company has no other

outlet for the purchased ore. Public sampling companies give the ore shipper the advantage of having his ore sampled in the camps and purchased by the sampler under mill or smelter contract and of receiving his money several days earlier than if he ships directly to the mill or smelter.

"By reason of the fact that the public sampling companies have no other outlet for ores purchased than the mills or smelters, it is obvious that such companies are more or less governed by the methods employed by the smelters and mills. This statement applies generally throughout the West to the sampling of gold, silver, lead and copper ores. The real function of the public sampling works is to aid the miner and the smelting and milling companies.

"There are public sampling works at Cripple Creek, Georgetown, Idaho Spring, and Central City, Colo.; in the vicinity of Salt Lake City, and at Ogden, Utah; at Millers and Hazen, Nev.; at Butte, Mont.; and at San Francisco, Cal.

### SAMPLING BY MILLING COMPANIES

"All well-regulated custom milling and smelting companies maintain their own sampling departments. The ore received is sampled and the results obtained from the basis on which the ore is purchased. This procedure is strictly followed whether the ore has been sampled once or a number of times before being shipped to them.

"At present the general attitude of the ore seller, in regard to sampling, appears to be one of satisfaction. Occasionally, of course, some individual shipper complains but in general complaints are not common.

"The facilities afforded by the public sampling companies and the mills and smelters for the sampling of all classes of ore have been developed to a high degree of efficiency.

### METHOD OF SAMPLING ORES

"No mill or smelter can treat each lot of ore separately. Such a procedure would be impossible because of cost and of technical difficulties. If separate treatment were possible, sampling might be unnecessary, for then the product of the operation on a given parcel of ore, or the value of the ore, could be turned over to the seller. But as this procedure is impossible the only method of determining the amount of valuable metals in the parcel of ore is by sampling, as above outlined.

"Sampling formerly done by hand labor and by crude methods, often inacurate, is now largely done by automatic machinery. A considerable part of the ores sampled by mechanical means is usually crused fine. Such crushing is undesirable if the ore is subsequently to be smelted in the blast furnace. For this reason lead-smelting plants, which must treat all ore, whether coarse or fine, by blast-furnace smelting, still practice the so-called hand sampling of oxide ores. The ores received by the lead smelter are broadly divided into two classes, sulphide ores and oxide ores. The sulphide ores, which must first be roasted and sintered (agglomerated) before smelting, are of necessity crushed fine, in order to facilitate roasting. The oxide ores, however, need not be crushed fine. It is customary, therefore, for lead-smelting plants to have a sulphide-sampling mill in which the sampling is conducted by standard mechanical means and an oxide-sampling mill where the sampling is done largely by the alternate-shovel method and by coning and quartering, in which only a relatively small part of the ore is crushed.

"The charges for the sampling are comparatively small (25 cents to $1 per ton) and are no burden in return for the benefits received.

"The final sample is a small part of the original lot of ore; perhaps one part in 60,000 to 30,000. The final sample is usually divided into four equal parts, which are placed in paper sacks and distributed to the interested parties, one being retained for reference. Glass bottles, instead of paper sacks, are used for sample containers by some companies.

"The practice followed in settling for ores after the metallic content has been ascertained is to split the results of the assays of the shipper and purchaser according to a previously arranged plan. On a gold ore, for example, assaying between 1 and 2 ounces, the practice is, if there be a difference of two to five points (0.0. to 0.05 ounce), to take the average, or "split the difference," of the two assays. If the ore contains 2 ounces or over, the allowance is four points (0.04 ounce), the purchaser and seller splitting this difference. If the purchaser's and seller's assays do not agree close enough to permit splitting the difference, a sample is submitted to some reliable independent assayer for an 'umpire' determination. Should the result of the umpire fall between that of the two disagreeing assays, his assay is taken as a basis of settlement, the interested parties sharing in the cost of the umpire's services. On the other hand, should the umpire assay be lower or higher the assay result nearest the one obtained by the umpire is then taken as the basis of settlement, and the cost of the umpire is paid by the one whose assay results were rejected.

"The umpire assayer is usually chosen by agreement between the ore buyer and the ore seller. In drawing ore contracts specifying the terms under which ore is bought it is customary to name three reliable assayers of reputation, satisfactory to both parties of the contract, from which the umpire assayer for any particular lot of ore may be selected. Frequently the ore purchaser, either a smelting or a milling company, pays the umpire, irrespective of whether the cost be assessed against the buyer or the seller of the ore. If the seller is liable for the cost, this is deducted on his 'settlement sheet,' which gives the net return on his lot of ore. Umpire assayers are sometimes criticized by the sellers of ore on the basis that no umpire assayer

could exist in business if he incurred the displeasure of smelting and milling companies, as such companies receive so many parcels of ore and thus control so much umpire work that their displeasure would mean a large loss of business to the umpire. The suggestion has been made that some central authoritative board of umpires be created to finally adjudicate disputed cases.

MOISTURE IN ORE

"Smelting and milling charges are practically always based on 'dry weight,' and assays and analyses on dried samples. The ore as mined and shipped always contains a certain amount of water as 'moisture.' The water in the ore may be present in two forms—as moisture or mechanically contained water; and in some instances in part as chemically combined water or 'water of crystallization,' this water entering into the chemical constitution of some minerals, such as kaolin and alunite.

"The ore may be rather wet when mined or may become wet in transit from mine to reduction plant. Although water of crystallization is a fixed unvariable quantity and is part of the ore, 'moisture' is a variable quantity, its fluctuations depending on the wetness of the mine and on weather conditions. Assays and analyses of two undried samples of the same ore rarely agree, as one of the samples may undergo some drying in transit and for this reason give higher results per unit weight than the wet sample assayed at once at the mine where it was taken.

"The practice therefore is to weigh the ore at the sampling plant immediately before sampling. This weight is called the 'gross weight of the ore. Then the ore is sampled, the sample is weighed and is dried in a steam bath at about 212° to 250° F., until the moisture is driven off. The weight is determined and the percentage of moisture removed is calculated. Deducting the calculated moisture from the gross weight gives the 'net weight' of the lot of ore to which the metal content of the dried sample corresponds. The temperature of drying is not carried beyond 212° to 250° F., in order that no water of crystallization may be removed. Water of crystallization is not expelled until a higher temperature is reached, and failure to expel all of it introduces another variable. The moisture in ores varies greatly, from about 2 to 30 per cent and more, according to the nature of the ore. Solid, hard, quartzose ore has the lowest moisture content, whereas clayey ore may contain a large percentage. It is evidently to the advantage of the shipper to ship ore as dry as possible, as freight is paid on gross weight and the shipper receives no return for the water content. Water may be and is often absorbed in large quantities by ore shipped in open cars, and the ore must be weighed before sampling, rather than to depend on railroad shipping weights at the point of origin.

"It is still a common practice to collect a 'grab' moisture sample in addition to the regular sample, by taking indiscriminately a number of shovelfuls from the lot of ore, on the assumption that moisture is lost during sampling and that a moisture determination on the final sample will result in crediting the shipper with too large a net weight. Such a haphazard method of determining moisture is usually inaccurate and should be discarded as unfair. The moisture in ore is chiefly in the fine part, and a 'grab' sample may contain an undue proportion of fine material. The moisture lost during the principal sampling operation can be allowed for by a correction. In Colorado experiments have shown that the loss in moisture during machine sampling is about 10 per cent in summer and 7 per cent in winter; that is, ore showing 5 per cent of moisture in the machine sample, actually contains 5.5 per cent during summer conditions. Hence moisture should be determined in the regular sample and the proper correction allowed for.

"The moisture content of ores is a frequent source of dispute and discord between buyer and seller, for no direct redetermination or resampling is possible, as is for the metal content, though the ore lot may be reweighed and this weight compared to the original wet weight and the percentage of moisture arrived at in this way.

ASSAYS AND ANALYSES

"As already stated, all such assays for gold and silver and other precious metal, and all such analyses for copper, lead, zinc, and other substances as may be necessary, are made on the dried sample. The precious metals, gold, silver, etc., are determined by means of the fire assay, and other metals and constituents by wet chemical analysis. The fire assay for gold, silver, etc., can be made with great accuracy, so that in the regular commercial work carried on daily in assay laboratories, one part gold in 3,000,000 parts ore, and one part silver in 300,000 parts ore are readily determined. One part gold in 2,916,660 parts ore represents 20 cents in a ton of ore. Assays of samples must agree within 20 to 60 cents in ores not exceeding $40 in value; a greater difference is permissible for higher grade ores. Silver is usually required to check within one-half to 1 ounce per ton. The troy ounce is the standard by which all precious metals are sold. The standard weight of ore in the United States is the avoirdupois ton of 2,000 pounds. The relation between troy and avoirdupois weight is found in the figures that 1 ton avoirdupois contains 29,166.6 troy ounces.

"The assayer, therefore, adopts as a unit weight in the laboratory the assay ton, which contains 29,166.6 milligrams, equal to 29.166 grams. With this standard weight of ore taken as a sample, every milligram of gold recovered therefrom represents an ounce troy per ton avoirdupois of ore. Assay balances weigh readily to 0.005 milligram, so that the determination of gold to 0.01 milligram,

equivalent to 0.01 ounce, or 20 cents gold, is not difficult. Accuracy may be increased by taking sample weights that are multiples of the assay ton.

"In the British Colonies gold is estimated in ore as ounces, pennyweights, decimal parts of a pennyweight, and also as grains per ton of 2,000 and of 2,240 pounds; in Mexico, as grams per metric ton (2,204.6 pounds), or as grains per short ton, or as ounces per short ton as in the United States. Copper, lead, zinc, and other constituents are determined as percentages. Thus, copper ore containing 10.10 per cent copper will contain 202 pounds of copper per ton. One per cent per ton, equivalent to 20 pounds, is frequently termed a unit, and payment for copper and lead is sometimes made on the unit basis. In commercial work the metals are usually determined to within 0.05 to 0.20 per cent, although sometimes greater accuracy is required. Other substances in the ore, as silica, lime, iron, and alumina, the amounts of which must be known in order to direct technical operations, are determined by rapid methods."

## CARL SCHOLZ PROMOTED BY ROCK ISLAND RAILROAD

Carl Scholz, president of the American Mining Congress, just has been appointed manager of the Mining and Fuel Department of the Chicago, Rock Island and Pacific Railroad. In this position he has charge of all mining operations and the purchase, handling and use of company fuel. Commenting on his promotion, the Western Trade Journal says:

"Formal announcement has just been made of the appointment of Carl Scholz, the well-known mining engineer, as manager of the Mining and Fuel Department of the Chicago, Rock Island and Pacific.

"Undoubtedly there is not a better known or more capable mining engineer in Chicago than Mr. Scholz, and during the many years that he has been associated in such capacity with the foremost corporations of the country he has accomplished many large undertakings and has established a most enviable reputation. In his new position Mr. Scholz will continue to make his headquarters in Chicago. The selection of Mr. Scholz for such an important post is fitting recognition on the part of the Rock Island of the ability of a man who has given so many years of his life to the solving of mining engineering problems.

"It is remarkable the large number of men who have won promotion or appointment with railroads or organizations affiliated with traffic work during the last few years. The purpose of the directorate appears to place in the most responsible positions men who have distinguished themselves in their particular line, and the appointment of Mr. Scholz appears to bear this out. Considering the growing importance of the Rock Island in the West and the magnitude of its mining and fuel department, it is absolutely necessary that the men in charge of this department have the widest experience in engineering and be able to show results.

"Carl Scholz was born in Slawentzitz, Germany, July 2, 1872, the son of Paul and Nannette (Schneider) Scholz. He was educated in Germany, and came to America in 1890. He married Eleanor Hay Barclay, of Lexington, Va., April 22, 1897. He has served as mining engineer for the Mount Carbon Company, Ltd., Powelltown, Va., 1891-94; manager and part owner of the Thomas-Scholz Coal Company, Riverside Coal Company, Superior Coal and Lumber Company, and Carbon Coal and Coke Company, Kanawha District, West Virginia, 1894-1901; manager of the mining department of the Chicago, Rock Island and Pacific since 1902, and president and director Rock Island Coal Mining Company, Coal Valley Mining Company, and vice-president and director Consolidated Indiana Coal Company, director of the First National Bank of Hartshorne, Okla., consulting engineer United States Bureau of Mines. He is a Republican in politics, member of the American Institute of Mining Engineers, American Society for Testing Materials, Western Society of Engineers, First Aid Committee War Relief Board of the Red Cross. He belongs to the Union League and Chicago Athletic clubs, is an Episcopalian, and resides at 700 Bittersweet Place, Chicago."

## PERSONALS

George Watkins Evans, of Seattle, is expected in Washington within the next few days, to consult with Secretary Lane in regard to Alaskan coal leases. Mr. Evans subdivided the Bering River field into leasing units.

E. Steidle, an engineer assistant to George S. Rice of the Bureau of Mines, will make his headquarters in Washington. Mr. Steidle had charge of the Bureau of Mines exhibit at the Panama-Pacific Exposition.

George S. Rice, chief engineer of the Bureau of Mines, who recently moved his headquarters from Pittsburgh to Washington, made a business trip to Pittsburgh last week.

Charles Enzian in the readjustment of the Pittsburgh office of the Bureau of Mines will be chief assistant to Geo. S. Rice, directing all coal mine investigations.

Chris Damm, a mining man formerly operating at Nome, but now at Lillouet, British Columbia, has been in Washington on a short business trip.

Sumner S. Smith, of Alaska, mine inspector for the Bureau of Mines, is in Washington for a conference with the Secretary of the Interior regarding Alaskan coal leases. Mr. Smith has subdivided the Matanuska field into leasing units.

H. M. Wolflin has assumed his duties in the newly created position of safety engineer at the Pittsburgh office of the Bureau of Mines. Mr. Wolflin will have charge of all rescue work in addition to certain other duties which devolve upon the office.

J. W. Paul, who has been in charge of the mine rescue work at the Pittsburgh office of the Bureau of Mines, has resigned and has begun consulting practice in safety and coal mining engineering, with his office at Pittsburgh.

Harry E. Kelly, formerly of the Denver bar and at one time United States attorney for Colorado, has resigned as attorney for the Interstate Commerce Commission to become a member of the legal firm of Cassoday, Butler, Lamb & Foster, of Chicago.

S. W. Wetherill has purchased 1,100 acres of zinc lands in Hancock County, Tennessee. It is understood that the consideration was $2,000,000. Few prospects have been opened in this area, but its value has been recognized for many years. Extensive development is anticipated.

Dr. G. Odell will leave Washington this month on a prospecting trip in Colombia. He will be accompanied by a party.

B. Bryan, mining engineer, who has confined his practice largely to Central and South America for the last ten years, is in the United States on a business trip. Mr. Bryan was graduated from Stanford University. He has made extensive trips recently through Western Colombia, where mining regions of great promise exist. He formerly had charge of the geological staff of the Barber Asphalt Company, in Venezuela. He also is interested in the Colahuasia Copper mines in Chile.

Whitman Cross, of the United States Geological Survey, one of the geologists who has been looking into the causes of slides in the Panama Canal, has returned to Washington.

J. C. Branner, formerly president of Stanford University, was in Washington recently after having visited Panama and several of the Caribbean Islands.

C. H. Gibbs, of Salt Lake, geologist of the Utah Fuel Company and also owner of the Consolidated Mines Company at Alta, Utah, was in Washington several days last month. Mr. Gibbs also is the owner of some very impressive appearing molybdenum mines near Alta.

Falcon Joslin, of Fairbanks, Alaska, formerly a director of the American Mining Congress, is in Washington on business.

### Anaconda Commission Meets

A meeting was held in Washington last month of the Anaconda Smelter Commission. It consists of John Hays Hammond, L. D. Ricketts and Van H. Manning. Only routine business was transacted, of which no announcement was made.

# AMERICAN MINING CONGRESS

## OFFICERS AND COMMITTEES, 1916

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M. S. KEMMERER, Second Vice President
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| Colorado | Irving T. Snyder | Denver |
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| Will L. Clark | Jerome, Ariz. |
| E. H. Benjamin | San Francisco, Cal. |
| Victor C. Alderson | Denver, Colo. |
| J. H. Richards | Boise, Idaho |
| Wm. Scallon | Helena, Mont. |
| Horace V. Winchell | Minneapolis, Minn. |
| E. B. Kirby | St. Louis, Mo. |
| D. C. McDonald | Ely, Nev. |
| C. T. Brown | Socorro, N. Mex. |
| Isadore Broman | Austin, Tex. |
| W. H. King | Salt Lake, Utah |
| L. K. Armstrong | Spokane, Wash. |
| Edwin Hall | Lusk, Wyo. |

### SPECIAL COMMITTEE ON REVISION OF MINERAL LAND LAWS, TO ACT WITH SIMILAR COMMITTEES FROM THE AMERICAN INSTITUTE OF MINING ENGINEERS AND THE MINING AND METALLURGICAL SOCIETY OF AMERICA

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| William Griffith | Scranton, Pa. |
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*In Metal Mines*

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Rukard Hurd.....St. Paul, Minn.
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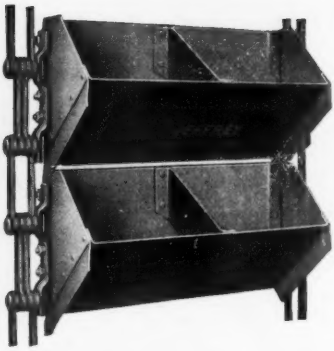

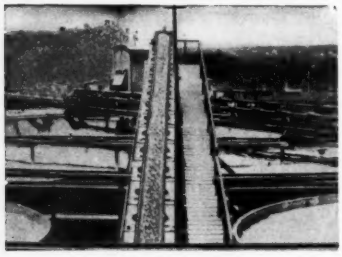

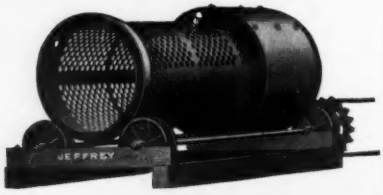


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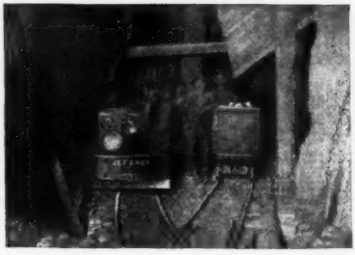

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